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New Signal Association Committees

A comparison of this year's membership list of the Railway Signal Association with that of a year ago shows an increase of 184 members, making a total of 2,063 on January 24, 1914. It is interesting to note that three special committees have been appointed in addition to the five that have heretofore been reporting. These new committees are to prepare information on the subjects of Lightning Protection, Signaling in the Southwest and Signaling in Canada. Although the only one of these committees reporting at yesterday's convention was that on Signaling in the Southwest, the fact that three new special committees have been added shows a demand for more comprehensive information, which is indicative of the progress in the work now being undertaken by the association.

Attendance at the Signal Convention

The attendance at both the sessions yesterday was fully as large as, if not larger than, that at any previous March meeting. And, contrary to the almost time-honored custom, it was large early. In other words the association began work practically on time and with practically the whole attendance in their places ready to begin. Except in one or two instances, when matters of policy broke in on matters of routine detail, the discussions were merely perfunctory. Considering the nature of most of the reports, however, they could hardly have been anything else. But such is the nature of progress that they must develop through perfunctoriness to interest, and the general feeling seems to be that the time is near at hand when the association will be ready to discuss matters of considerably more interest than has been usual at mid-year meetings.

Recording Signal Performance

Last year the special committee on Methods of Recording Signal Performance presented three signal report forms—a conductor's or engineman's telegraphic report form, a dispatcher's telegraphic report form and a maintainer's report form. This year's report includes these three forms, with revisions suggested at last year's convention, and, in addition, contains two new report blanks, one for the use of signal inspectors or maintainers, and the other for the signal engineer or supervisor. The practices of various roads in the use of a signal engineer's or supervisor's report were widely diversified, and it was almost impossible to select any one form that met the committee's requirements. A form was designed for this purpose, and is shown in the committee's

report. The committee is to be congratulated on the thorough way this work has been handled. The presentation of last year's report in a revised form, together with two new report blanks and a detailed description of the one for use by the signal engineer or supervisor, drawn as they were with the practice of many roads in mind, speaks well for the committee's efforts to effect the adoption of a standard form. With the adoption of a standard form will come a standard basis of computing efficiency as well as a better means of keeping operating officers in touch with what the signals are doing. And, incidentally, a uniform method of recording signal performance would make it easier to inform the general public as to what signals are for and with what efficiency they operate.

OMITTING THE DETAILS

Mr. Fugina struck an interesting note—which evidently found an echo in the minds of the majority of those present yesterday morning—when he suggested the policy of ceasing to give so many details of specifications for small material. His point was that all the necessary requirements of such a thing, for example, as a washer could be well enough set forth on a drawing alone—without the usually accompanying and often painfully explicit explanation.

His motion to that effect "went over big." Even a few years ago such a proposal would have been considered almost heretical, but of late the sentiment has developed rapidly that the association's meagre and valuable meeting hours should be given over to considerations of more importance. It is showing poor confidence, indeed, in the intelligence and capability of a committee to subject its report to such minute discussion as some reports are subjected to; but would the discussion be so painstakingly filled with detail if the reports themselves were less so? In other words, if the association will make it possible for the committees to omit a lot of the minutæ, it will then become possible for the association itself to escape the resultant waste of time discussing it. The new policy ought to be extended to much bigger things than washers. Incidentally it is interesting to note that the motion as carried expressed an idea exactly the opposite to the instructions which have previously been given to committees to separate the drawings and specifications. Now comes the new policy. It is a good one, and it is much to be desired that it find permanent lodgment in the association's order of business. It has its limitations, of course, as, for example, in the case of specifications for copper sulphate. But it is the right idea, nevertheless, and will save many valuable moments if followed out, as it was, in fact, until about two years ago, when the craze to elaborate became so popular, and before it was discovered that elaboration is very burdensome to the Manual.

THE COMBINED MAINTENANCE REPORT

As the report of Committee 1 indicates, combined maintenance is still in the experimental stage, and the results are problematical. The committee outlines several methods of combining signal and other forces, but says that the results of the adoption of any combined system cannot be foretold; that labor, traffic and climatic conditions are all involved, and a system successful on one road might be uneconomical for another. This is true to a certain extent, but let us investigate the results obtained on three roads where combined maintenance has been tried.

In April, 1910, the Union Pacific double-track main line between Kearney, Nebraska, and North Platte, a distance of 95 miles, was equipped for combined maintenance. The actual savings are hard to compare because of the use of motor cars and the lengthening of the sections. But, whereas the cost of maintenance on the Nebraska division was, before the adoption of combined maintenance, the highest on the road, it has now dropped to the next to the lowest. This has been effected despite the fact that this portion of the main line carries the heaviest traffic. Friction in the maintenance department has disappeared, and insulated joint and avoidable signal failures have greatly decreased. The Union Pacific now has this plan installed on 351 out of a total of 561 miles of main line on the Nebraska division.

The Illinois Central put a similar plan into operation on 41 miles of double track between Ballard Junction and Fulton, Ky., in October, 1912. When the plan was first tried the signal failures greatly increased. A general foreman was then detailed to instruct the men in handling the signals, and since then the number of failures has decreased.

The Chicago & Alton combined its track and signal forces on 30 miles of double track between Bloomington and Ocoya, Ill., in April, 1913. This test lasted only three months—barely long enough to begin to overcome the bad effects of the change.

In view of the fact that combined maintenance has been tried on three roads, with varying results, it seems strange that the committee should overlook this valuable data and make no mention of it in its report.

The success or failure of combined maintenance depends largely upon the extent of the preliminary education of the forces. Under any conditions, a certain increase in signal failures is unavoidable. That the test on the Alton did not last long enough to overcome the failures due to the change is shown by the fact that a great reduction in failures has resulted on the Union Pacific and the Illinois Central. On the Union Pacific the number of failures is now lower than under the old division of labor.

With proper preliminary instructions to the men, there seems to be no reason why the track and signal forces cannot be economically combined. And when the time comes to install this system on other divisions, men educated and practiced in the use of combined labor can be assigned to do the preliminary work of instruction.

RECEPTION AND DINNER FOR IRA O. BAKER

A reception and dinner in honor of Ira O. Baker, professor of Civil Engineering at the University of Illinois, will be held this afternoon and evening at the hotel La Salle, Chicago. The reception will be held in the east room of the hotel from 3:30 to 5 in the afternoon, at which an opportunity will be given to greet Professor Baker personally. Ladies are invited to the reception. Dinner will be served at 6:30, and the indications are that the attendance will exceed 450. William D. Pence, member of the Engineering Board of the Interstate Commerce Commission, will act as toastmaster, and the presidents of a number of the technical societies of which Professor Baker is a member will present their greetings.

W. W. SLATER RETIRED ON A PENSION

After over half a century's service as a railroad man, W. W. Slater, formerly signal engineer of the Southern Pacific, has retired from service on a pension. Mr. Slater was the inventor of the principle of the automatic block signal, and the leading part he took in the establishment of the sound principles upon which block signaling is now based earned him the title of dean of signal engineers.

He was born in January, 1849, and began his railroad service in 1862 as a newsboy on the Columbus, Piqua & Indiana. From 1864 until 1868 he worked as a telegraph operator on various eastern roads, and in 1868 he went by stage to Salt Lake City to engage in the same work.

In 1869 he opened the first telegraph office in Ogden, and three months later he saw the first Union Pacific train arrive.

In 1869 he became freight operator on the San Francisco & San Jose. In June of that year he was made material clerk and operator at Warm Springs, securing track material for an extension of the road. In 1865 he became signal engineer for the company.

The standards of construction adopted by Mr. Slater during the development of the interlocking and block signal work on the Southern Pacific lines from 1885 until the present time served as a guide for many other roads in extensive work carried on by them, and by many foreign lines in the western and Pacific coast section of the country.

PROGRAMME OF AMERICAN RAILWAY ENGINEERING ASSOCIATION

The following is the programme for the convention of the American Railway Engineering Association. The programme is subject to change by a two-thirds vote of the convention or by time required for consideration of reports.

Morning Sessions—9:00 a. m. to 12:30 p. m.
Afternoon Sessions—2:00 p. m. to 5:30 p. m.

Tuesday, March 17.

President's Address.
Reports of Secretary and Treasurer.
Reports of Standing and Special Committees.

XII.	Rules and Organization	Bulletin 162
X.	Signals and Interlocking	Bulletin 162
XIV.	Yards and Terminals	Bulletin 162
I.	Roadway	Bulletin 162
VII.	Wooden Bridges and Trestles	Bulletin 162
XV.	Iron and Steel Structures	Bulletin 163

Wednesday, March 18.

VIII.	Masonry	Bulletin 163
V.	Track	Bulletin 163
XVIII.	Electricity	Bulletin 163
XVII.	Wood Preservation	Bulletin 163
Special.	Grading of Lumber	Bulletin 163
XIII.	Water Service	Bulletin 163
VI.	Buildings	Bulletin 163
IV.	Rail	Bulletin 164

Annual dinner at 7:00 p. m.

Thursday, March 19.

III.	Ties	Bulletin 164
IX.	Signs, Fences and Crossings	Bulletin 164
XIX.	Conservation of Natural Resources	Bulletin 164
XVI.	Economics of Railway Location	Bulletin 164
Special.	Uniform General Contract Forms	Bulletin 164
XI.	Records and Accounts	Bulletin 164
II.	Ballast	Bulletin 164

New Business.
Election and Installation of Officers.
Adjournment.

Friday, March 20.

Visit to National Railway Appliances Exhibition in the Coliseum and Armory.

J. BEAUMONT PRESENTED WITH A RING

J. Beaumont, who recently resigned as signal engineer of the Chicago Great Western to become senior signal engineer with the engineering board, division of valuation, Interstate Commerce Commission, happened into his old office yesterday morning and discovered an informal little surprise party, organized on the spot, for the purpose of presenting him with a handsome diamond ring, on behalf of the official staff and employes of the entire system. The presentation was made by Signal Inspector W. J. Mullins, who was Mr. Beaumont's chief clerk. Mr. Beaumont had been with the Great Western for four years, and in addition to his duties as signal engineer was editor of "The Maize" and chairman of the Safety Committee.

CATALPA TIES

Samples of catalpa ties and posts which were planted on the Harahan plantation at Harahan, La., in April, 1902, and cut in December, 1913, attracted considerable interest in the office of Secretary Fritch yesterday afternoon because of their large growth in 11 years.

OUTLINING WORK OF WOOD PRESERVERS' ASSOCIATION

The officers and members of the various committees of the Wood Preservers' Association are in session Monday and Tuesday at the Congress hotel, outlining the work for the association for the coming year. About 30 members are in attendance.

SOUTHERN PACIFIC OFFICERS IN ATTENDANCE

W. L. Hesterly, of Morgan City, La.; E. M. Moursund, of Ennis, Tex.; A. E. Triplett, of Victoria, Tex., and John Hitt, Hempstead, Tex., assistant superintendents of the Southern Pacific Lines in Texas and Louisiana, arrived yesterday to spend the week at the convention and Coliseum.

THE ANNUAL BANQUET

Tickets for the annual banquet to be held in the Gold room of the Congress hotel at 7 o'clock Wednesday evening, will be on sale at noon today at the office of the secretary opposite the convention hall. With the present indications of a large attendance, the Committee on Arrangements desires that all who plan to attend secure their tickets early to avoid confusion and disappointment at the last minute.

The principal speakers at the dinner will be Hon. Charles A. Prouty, director of valuation of the Interstate Commerce Commission; Hon. Charles Marcil, member of the Canadian Parliament, and J. M. Schoonmaker, vice president of the Pittsburgh & Lake Erie.

L. C. FRITCH TO THE CANADIAN NORTHERN

Announcement was made yesterday that Louis C. Fritch, chief engineer of the Chicago Great Western, with office at Chicago, and formerly president of the American Railway Engineering Association, has resigned, effective April 1, to become assistant to the president of the Canadian Northern, with office at Toronto. Mr. Fritch began railway work in 1884 as supervisor's assistant on the Ohio & Mississippi, and from January, 1886, to October, 1892, was assistant engineer of that road, being made engineer maintenance of way on the latter date. From November, 1893, to September, 1899, he was division engineer of the Baltimore & Ohio Southwestern, which absorbed the Ohio & Mississippi, and then for three years he was superintendent of the Mississippi division of that road. He went to the Illinois Central in February, 1904, and for one year was engaged in special work, being made assistant to the general manager of that road in March, 1905. In November of the following year he became assistant to the president, and in March, 1909, he was appointed consulting engineer, resigning in November of that year to accept the position of chief engineer of the Chicago Great Western. He was president of the American Railway Engineering Association 1909-1910.

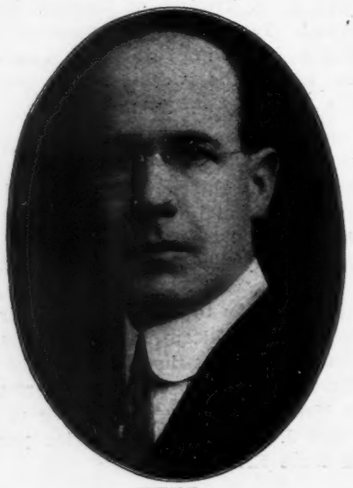
Railway Signal Association Proceedings

Reports of Committees I, IV, V, VI, VII, X and Special Committees, together with the Discussion

The stated meeting of the Railway Signal Association was called to order at 9:30 a. m. on Monday, March 16, in the Florentine room of the Congress Hotel, Chicago, by President F. P. Patenall, signal engineer of the Baltimore & Ohio. The following committees submitted reports for discussion: Committee I on Signaling Practice; Committee IV on Automatic Block; Committee V on Manual Block; Committee VI on Standard Designs; Committee VII on Subjects and Definitions, and Committee X on Storage Battery and Charging Equipment. Reports were presented by the special committees on Method of Recording Signal Performance, Signal Requirements of Electric Railways and Signaling in the Southwest.

AUTOMATIC BLOCK

The committee was instructed to prepare specifications for apparatus and materials used in automatic signal construction. Under the head of this subject the committee presented specifications for wooden pole line brackets, pole line washers, caustic soda primary battery and specifications for copper sulphate, these to be discussed with the view of final presentation at the annual convention. The caustic soda primary battery specifications will be discussed again at the June meeting, embodying such changes as are thought necessary by those present at the March convention.



A. G. SHAVER,
Chairman Committee on Automatic Block.

The committee consists of A. G. Shaver, chairman (C. R. I. & P.); A. R. Fugina, vice-chairman (L. & N.); E. L. Adams (L. S. & M. S.), E. E. Bradley (W. M.), G. H. Dryden (B. & O.), E. Folley (C. & E. I.), R. E. Greene (M. C.), W. R. Hastings (C. R. I. & P.), W. H. Higgins (C. R. R. of N. J.), B. A. Lundy (N. Y. C. & H. R.), R. M. Phinney (C. & N. W.), D. W. Rossell (N. Y. C. & H. R.), E. K. Post (P. R. R.), A. H. Rice (D. & H. Co.), D. S. Rice (N. & W), G. W. Trout (P. M.), W. B. Weatherbee (D. L. & W.), and F. E. Whitcomb (B. & A.)

Discussion on Automatic Block.

The report was read by A. G. Shaver, chairman, by topics.

E. L. Adams (L. S. & M. S.): The sub-committee on relays is working toward completing the present specification for this relay. There has been some question amongst the manufacturers and the users of the relay, particularly with regard to the contact pressure. The sub-committee would be helped a good deal if they could get an expression from the members as to whether we should specify definitely that the top, that is, the part supporting the contact posts and magnets, should be of an insulated material rather than of metal.

W. H. Elliott (N. Y. C. & H. R.): I would move that in our opinion the insulating top is to be preferred, and if the committee can consistently recommend that kind of a top, it should do so.

(The motion was carried.)

Mr. Shaver: In connection with this subject the committee has for several years felt that it should not get to the point of trying to dictate a standard relay. However, the committee has come to the conclusion that certain parts can be standardized and have recently sent letters to the manufacturers concerning those parts.

A. R. Fugina (Vice-Chairman): Each manufacturer, as a general thing, uses different parts. There are many parts so near that they vary by 1-32 in. in the thread. That means that a railway company doing repairs to relays has got to carry innumerable parts to make repairs to relays carried in stock. The committee feels, if the manufacturers will work with us on this, the committee can simplify this to a large extent.

Mr. Shaver: I desire to bring up the question of ventilation, which is a very important one. In my opinion the method of ventilating the relays, as is now done in some cases by a hole in the bottom is not doing any good. I have seen tests of two pipes side by side, and one showed sweating as badly as the other. I have known of some rather bad failures occurring because of the relay sweating and freezing. This committee would like to get any information anyone has on that phase of the subject.

G. H. Dryden (B. & O.): The work of the sub-committee on circuits has been about completed. The changes made relate principally to single-track automatic block signaling. After taking up the subject with the committee as a whole it was decided that the outgoing signal at passing sides should be located at the fouling point rather than at the main switch; also that a bracket pole or bridge signal shall be used and both tracks shall be signaled from the passing side. We have given considerable thought to the question of important crossings protection, and by cutting out the use of common wire at such crossings we feel that that part of the question is well taken care of. Our report will be presented at the June meeting.

C. J. Kelloway (A. C. L.): To my mind the specification for so simple a device as a pole line bracket is too elaborate. We have the drawings and plans, and in the case of quite a number of these standard designs we do not prepare specifications of this kind. I would suggest that we add to this drawing a simple specification reading about as follows:

(a) Brackets shall be made of sound oak and thoroughly kiln dried, free from loose or unsound knots, worm holes and large size shakes or cracks.

(b) Sound sap wood will be allowed, provided it does not extend into the turned portion above a point 3¾ in. from the end of the bracket.

Then copy in paragraph (d), as (c).

C. E. Denney (N. Y. C. Lines): I think it would be a good plan for our Association to approve the W. U. specification exactly as written. It will simplify the labor of securing material.

W. J. Eck (So. Ry.): When the committee presents this specification again I would suggest that they go over it and see that they include nothing in here that is shown on the drawing.

C. C. Anthony (Penn.): I think it would be well for the committee to see if they cannot shorten the specification and simply approve, as was suggested, the Western Union specification. If we change the specifications and the Western Union change theirs in some slight detail we will have one specification and they will have another.

Mr. Denney: There is only one serious objection to adopting a standard that is not exactly the same as the Western Union, you cannot get your material promptly. I see no objection to printing on our drawing "In accordance with the Western Union specification, of (date), approved by the Railway Signal Association," if we want to show that in our proceedings.

Mr. Shaver: If the Western Union specification is adopted as it stands, without adding to it, then you will have nothing to cover the points beginning with paragraph 5, and beyond. You will have nothing to signify what your accepance terms will be, the markings, sampling or anything else. If those points are provided for, we could follow the Western Union specification.

Mr. Peabody: I move that the drawing as shown, with slight revisions to which the chairman has referred, be adopted, having the statement on the bottom that pins are to be made in accordance with the Western Union specifications.

(The motion was carried.)

Mr. Shaver: In the table of allowable variations, in the specifications for pole line washers, there is an error that does not appear on the drawing.

Mr. Kelloway: To my mind the drawing covers the design, and I cannot see the use of a specification for such a simple thing as a washer. I would eliminate these specifications.

Mr. Fugina: I think the Association should take a stand as to whether it wishes small detail parts like this covered by specifications as well as drawings, or not. I move that we strike out the written part of the specification and let the drawing be the specification, and put it up to the committee as to how that drawing shall be labeled and submitted to the Association.

(The motion was seconded and carried.)

Mr. Fugina: I move that in the interest of construction and uniformity, that in the future in drawing specifications of this kind, we submit the matter by drawing and not by written specification as well as the drawing.

(The motion was seconded and carried.)

Mr. Shaver: The change in the specifications for caustic soda primary battery, eliminates the one-ampere-hour test for the three-ampere-hour test, accomplishing the same thing that we do now with the present specification. In connection with paragraph (b) of section 5, it is proposed to describe the exact method of making the test. Some roads use long leads, two or three instruments, and some short leads. That makes a difference in the drop in voltage test. Some of the manufacturers have agreed that a three-ampere discharge for 120 hours can be met by the battery which they manufacture. It is desirable to have a test that can be made in a few hours to determine whether the battery is meeting the requirements of the specifications.

M. L. Martus (The Waterbury Company): As a representative of one of the battery concerns, I would suggest altering the discharge rate to a four-ampere discharge, running somewhere between 75 and 100 hours, four amperes continuously. In that way it would give the railroads a chance to determine in a much shorter time what the cells would do, and all of the batteries of this type would be on a fair and equal footing in the test.

F. J. Leprean (Thomas A. Edison, Inc.): I think that the three-ampere test is the one that will meet the requirements better than any other test that can be made. The average signal we work with now, operated by primary batteries, requires from 2½ to 3 amperes, and occasionally the peak goes beyond three.

Mr. Martius: The higher the ampere draft the greater the tendency for the cell to polarize. Therefore, if the cell will stand the four-ampere draft for a certain number of hours at a certain temperature, that test would be as fair as the present test and would be finished much quicker.

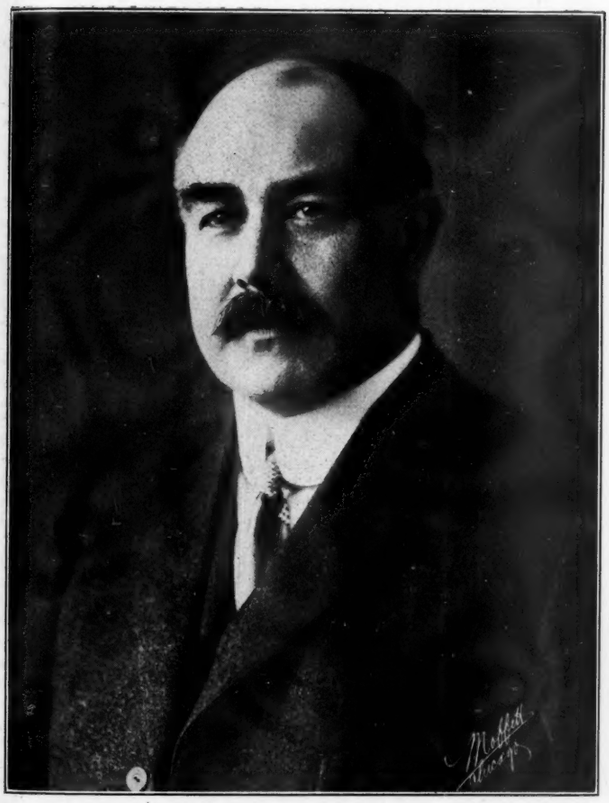
Mr. Elliott: It has been my experience that this test is too severe and that for the present battery a 300 ampere discharge at a continuous rate of 3 amperes will not be obtained. The cell will polarize too quickly and a fair test of what the battery would give out under working conditions would not be obtained. I also believe that the acceptance of the material should be made to stand on the result of one test, but if all of the materials are satisfactory and good, one test should be sufficient.

H. F. Mock (C. & N. W.): It would be better to conduct a test which approximates the use by means of an interrupter. If we have a discharge of fifteen seconds at 3 amperes, corresponding to the holding position of the signal for fifteen seconds, that would prolong the maximum time for discharge, thus giving the cell a chance to adjust itself and to depolarize.

Mr. Denney: The real reason for the 3-ampere test is to determine if the particular cell will do business at a three-ampere discharge. I do not think it should be less and I do not think it should be more than the work the cell requires. The temperature requirement of 70 degrees is too rigid. All that would be necessary to specify would be not less than a minimum temperature.

Mr. Shaver: We want a test as fair to the manufacturer as to the railroad.

Mr. Eck: I think the committee should determine the per-



F. P. PATENALL, President.

T. S. STEVENS, Vice-President.

centage of the total number of batteries purchased that should be tested.

Mr. Denney: I think in fairness to the meeting, before we pass on the subject we ought to know how the manufacturers stand on it.

Mr. Lapreau: I have the impression, in one or two meetings of the committee, that no companies entirely agreed to this test. The only thing on which discussion developed was the manner of conducting the tests. As far as the test itself was concerned, it was not agreeable to anyone.

Mr. Martius: Some manufacturers were represented at that meeting, but nothing conclusive was decided upon and the matter was held in abeyance. Since that time we have heard nothing further relative to it until it was published in the Manual. Some other things should be taken into consideration before that specification is adopted as such a means for testing, which are now not very specific. Also the means which determine whether or not the battery meets the specification.

(This part of the specifications was referred back to the committee.)

Mr. Eck: The specifications of copper sulphate, so far as the quality of the material is concerned, are exactly the same as the specifications now in the Manual. The only addition which is vital, which has been added, provides that in case of controversy with the manufacturers, the railway company's methods of testing shall be used. I think it would be well if this committee would outline the method of testing, so that the manufacturers would know exactly what they are up against and there will be no chance for controversy.

Mr. Elliott: It is my opinion that there is not enough new matter in this specification to warrant our printing the specification in the Manual, and I suggest that the committee take this into consideration and withdraw the specification.

President Patenall: The committee accepts Mr. Elliott's suggestion:

MANUAL BLOCK

The committee presented resolutions recommending changes in the present American Railway Association rules for signalmen and trainmen. These resolutions are to be presented to the American Railway Association with the intention of securing recognition of the caution card as a means of moving trains past the interlocking signal at stop where the stop indication is brought about by interruption of the signal apparatus.

G. S. PFLASTERER,
Chairman Committee on Manual Block.

The committee consists of G. S. Pflasterer, chairman (N. C. & St. L.); L. R. Mann, vice-chairman (M. P.); E. T. Ambach (B. & O. S. W.), Hadley Baldwin (C. C. C. & St. L.), J. Beaumont (Interstate Commerce Comm.), M. W. Bennett (N. Y. C. & H. R.), E. A. Black (L. S. & M. S.), B. O. Darrow (S. P.), Caleb Drake (C. & N. W.), M. J. Fox (C. B. & Q.), H. K. Lowry (C. R. I. & P.), W. N. Spangler (R. R. Supply Co.), and T. S. Stevens (A. T. & S. F.)

Discussion on Manual Block.

The report was read by G. S. Pflasterer, chairman, who also said: This committee presents for consideration subject (b), "Continue preparation of rules for the maintenance and operation of interlocking plants and block signals." It also "submits a resolution for presentation to the American Railway Association, with the intention of securing recognition of the caution card as a means of moving trains past an interlocking signal at stop, where the stop indication is brought about by interruption of the signal apparatus, and the resolution is supplemented by suggested rules. These rules, if adopted by the Association, to be submitted to the American Railway Associaton with the resolution."

H. K. Lowry (C. R. I. & P.): The committee presents Rule 629 (a) as a proposed alternative to Rule 629.

Mr. Elliott: I note that rule 629 (a) has not been reframed in accordance with the action of the Association taken at the Nashville convention, which was that provision should be made in this rule for hand signals, to be given as against interlocking signals, indicating stop.

L. R. Mann (Mo. Pac.): The discussion at Nashville was on the thought that the hand signals would be eliminated at interlocking plants, but that is not so. This is a proposed alternative to 629, that is, if there are conditions where you want to use 629 (a) you can use if, if you want to use the old rule 629, you can use it; but it is the practice of some railroads to use the caution card. My understanding is that the Chicago Great Western and the New York Central are two roads that use it, and I have heard that the Baltimore & Ohio use it to some extent.

Mr. Elliott: I would like to say that the New York Central does not use the rule. The rule used by us is as follows: "Rule 616—Hand signals must not be accepted as authority to pass any signal indicating stop except for switching movements when the governing signals cannot be clear. They must be given by the signal men from the ground upon the track for which they are intended, and only after the train or engine which is to make the movement has been stopped and the situation fully explained and understood."

J. Beaumont: The committee, in taking this rule under consideration had in mind all of the discussion that took place at Nashville, and also had in mind the fact that Mr. Elliott, as well as Mr. Denney, made a statement at that time that might have led many members to believe that their lines did not use the caution card in a general way. That is true, but the rules on both the Lake Shore and New York Central lines specify that caution cards must be used as authority to pass interlocking signals at stop, but make the proviso that under certain conditions the hand signals shall be used for switching movements. Rule 629 as originally presented, the present code rule, is purely a hand signal rule. On the other extreme the rule proposed by the committee is purely a caution card rule, as an alternative. The thought of the committee in presenting this matter to you to-day is this: If we provide the two extremes in the operation of trains, that any railroad will be able to select an agreeable point somewhere between the two extremes.

L. S. Rose (C. C. C. & St. L.): I am opposed to this rule, in an alternative or any other way. I think the present rule is all right. In going through the rules for manual block, there are caution cards provided for and restrictions on passing signals at stop, and the method prescribed indicate that the caution card has been thoroughly understood by operating official, and that the rule as framed was made with a purpose.

Mr. Denney: I do not think the rule is just what it ought to be, but I doubt whether it would be advisable for this Association to make a recommendation to the American Railway Association, saying exactly what we think should be provided. The end would be better accomplished by this Association making a statement to the American Railway Association saying that we suggest that some provision should be made for the use of caution cards as a means of passing a train by a fixed signal, which could not be made to indicate "Proceed," and let them work it out.

Mr. Denney: The code is not fashioned so that a number of alternative rules are given, but either in itself is recommended by being placed in the code, and it is not usual, and certainly not the intent of the code that the rules shall be combined and whipped into any shape desired by the road using it. If anything is put into the code, it should be a rule alternative with 629, which would provide in itself without any revision, another method of accomplishing the end.

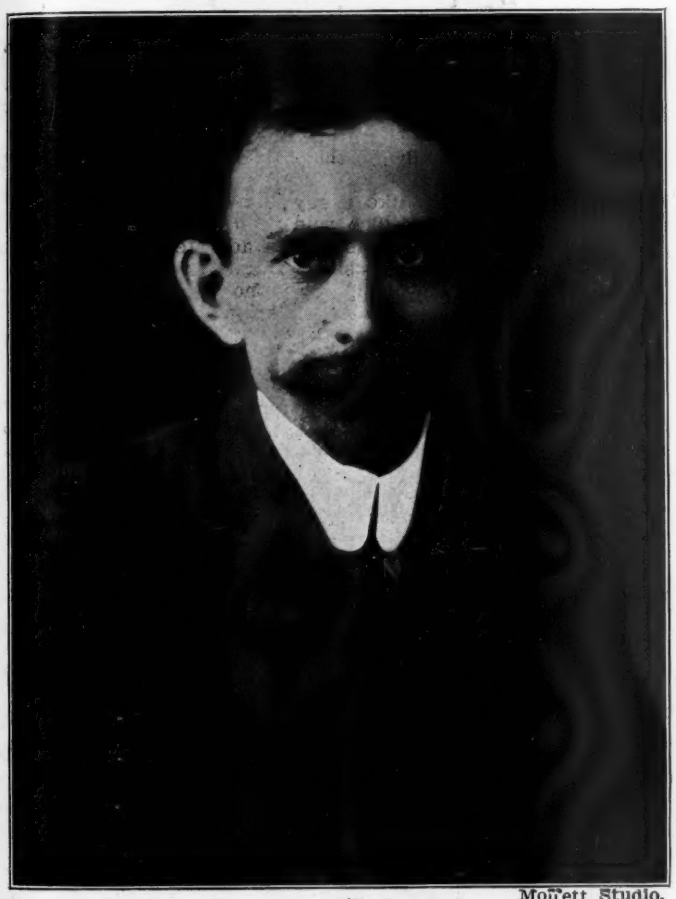
Mr. Beaumont: We still believe that the rule as presented is right. Many of the leading lines, the Lake Shore, the New York Central, Baltimore & Ohio and part of the Great Western, are willing to adopt the caution card. Many

have adopted the caution card, but unfortunately there is no provision in the code for the caution card in connection with interlocking plants. Considering the increased safety that can be brought about in operation by tying up the signal man and the engine man into a definite understanding at a time when danger threatens the train, the interlocking plant is deranged, I think it will be readily admitted that we want delay and safety. This rule is presented by the committee with a view of absolutely tying up both ends of the situation, with the object of moving the train under a thorough understanding of all parties concerned.

Mr. Denney: I move that it is the sense of this meeting that rule 629 (a), as submitted by the committee, should not be approved for submission to the American Railway Association.

Mr. Elliott: I second the motion.

Mr. Denney: The committee has submitted a rule. They say it is extreme and the railroads can work something out of 629 and 629 (a) that will be satisfactory. That is the principal reason I do not think it should be submitted to the A. R. A., because it does not outline a practice. Most roads, after considering the rules, would want to use one or the other as written. I do not think it is proper in this form.



Moffett Studio.

W. J. ECK, Vice-President.

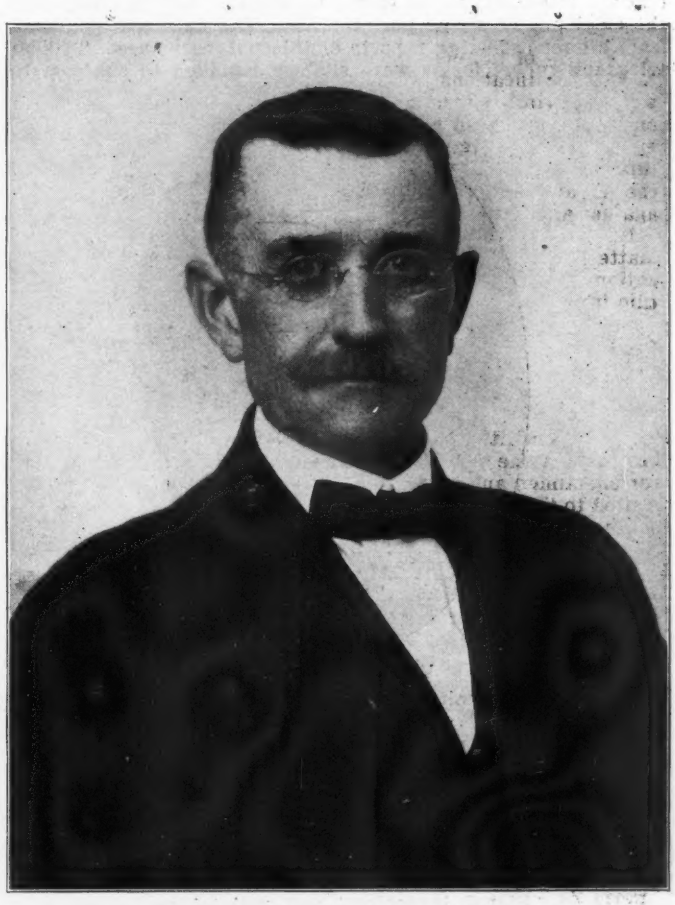
Mr. Rose: I want to support Mr. Denney's motion. I do not quite agree with the principal speaker of the committee that this is the safety measure. I think safety cards are recognized and provided for very freely.

Mr. Beaumont: The caution card adopted for use in Manual block territory was adopted because it was the best means of handling the traffic. Our predecessors found that it was not practicable or safe to give a hand signal before a train passed a block signal and through a block. We found it necessary to issue a caution card in order to increase the safety of that movement. After all, in connection with an interlocking plant, when it is deranged, we have a condition that necessitates extreme caution. If we delay a train under such rare conditions a few minutes there is no harm done. We want delay under those conditions. We owe it to ourselves to have delay under those conditions. We say in the old code rule that they must not proceed until they are fully informed and know that they are protected. I believe that a thorough consideration of this subject will bring out very plainly that a train crew receiving a hand signal to pass an interlocking signal at stop does not have the assurance that they are protected. Then how shall we inform them, how shall we secure safety? By introducing additional protection, by a caution card.

J. V. Young (B. & M.): I believe the use of the caution card on the Manual system out in the country is all right, but you can't use it on the terminals. If we undertook to use the caution cards in our yards we would not be able to move many trains.

Mr. Denney: I move that the committee be authorized to prepare a statement outlining the situation for the American Railway Association's consideration.

Mr. Rose: My objection to the rule is that it would be impracticable to operate. I don't want to see a rule written in the book that I am going to be arrested for violating. I think that we should not take our own experience altogether as a guide. We should take the experience of all of the roads. I could show two or three hundred interlocking plants where we would have a great deal of trouble in operation under that rule. I say it is not a rule for safety.



C. C. ROSENBERG, Secretary and Treasurer.

Mr. Smith: I believe we have always used a caution card for block signal, and in the Manual block territory, as we use it, we use it as a block signal or interlocking signal, and we use the card to put the man into the block, not only through the interlocking plant, but through the block, and we might have the rule on that basis strictly, as an interlocking signal, or as a block signal.

Mr. Denney: Where do you hand him the card?

Mr. Smith: At the block signal.

(Mr. Denney's motion was then carried.)

Mr. Denney: I move that it is the sense of this meeting that the committee be instructed to prepare a statement of recommendation to the American Railway Association as to the approval of the use of caution cards as a means of passing trains at interlocking home signals in the stop position.

(The motion was seconded and carried.)

Mr. Kelloway: Do I understand that rules 701, 702, 703 and 704 have been adopted by this Association?

Mr. Pflasterer: These rules have not been adopted by the Signaling Association, but have been adopted by the American Railway Engineering Association.

Mr. Rudd: I suggest that rule 701 is correct. I suggest

that rule 702 may be modified to read: "They shall be responsible for the safe condition and proper maintenance of signals and interlocking plants, and shall perform such other duties as may be assigned to them by the . . . L." Let 701 and 702 cover the subject. I think the supervisor of signals should be able to instruct his men exactly what to do. If he does not know enough to do this, he is hardly competent to be a supervisor of signals.

Mr. Denney: I agree with Mr. Beaumont and Mr. Rudd. I see no reason why the committee should not start at the beginning with the A. R. E. A. rules, as they pertain to the signal department, as these do.

The rules were referred back to the committee for revision as mentioned.

METHOD OF RECORDING SIGNAL PERFORMANCE

The committee was instructed to investigate a report on the basis of methods now used on various railways in recording interruptions to traffic by signals, and in computing the efficiency of signal performance. The data was collected from all roads having reports of this nature in use. Typical telegraph report forms were slightly modified to conform to

W. N. MANUEL,
Chairman Committee on Method of Recording Signal Performance.

reasonable suggestions, and are printed in the committee's report.

The following forms were submitted for consideration.

Form 11. Conductors' or enginemen's telegraphic report.
Form 12. Dispatchers' telegraphic report.
Form 21. Maintainers' report.
Form 22. Signal inspectors' and maintainers' report.
Form 31. Signal engineers' or supervisors' report.

The committee presented this complete set of signal performance forms and necessary instructions for their use.

The committee consists of W. N. Manuel, chairman (G. R. & I.); L. L. Whitcomb, vice-chairman (L. S. & M. S.); C. A. Cotton (A. T. & S. F.), B. F. Dickinson (W. J. & S.), Paul M. Gault (I. C.), S. B. Keller (B. & O.), G. W. Kydd (B. & O. S. W.), Geo. J. Patton (D. L. & W.), C. O. Warner (N. Y. N. H. & H.), and J. B. Weigel (St. L. & S. F.)

Discussion on Recording Signal Performance.

Considerable discussion was offered in regard to Form 11 concerning the omitting of the headings R and O, but it was finally accepted as presented by the committee. Form 12 was also accepted with a little discussion.

STORAGE BATTERY AND CHARGING EQUIPMENT

The committee submitted the report in the form of a discussion in order to avoid unnecessary expense and confusion in the issuing of plates of drawings in preliminary form. This report covers storage battery jars; sand trays and covers, hold downs and sizes of storage battery. The committee expects to have this report in final form for discussion at the June meeting.

The committee submitted a report on the use of jelly electrolyte in connection with lead type storage battery, and recommended that this electrolyte not be used.

Specifications were submitted for electrolyte for lead type storage battery; specifications for concrete storage battery box, including drawings 1342-1343, and specifications for Edison storage battery.

Drawing 1345, showing single throw switches and drawing 1344, knife switches and slips were also submitted.

The committee consists of R. B. Elsworth, chairman (N. Y. C. & H. R.); G. E. Beck, vice-chairman (L. S. & M. S.);

R. B. ELSWORTH,
Chairman Committee on Storage Batteries.

J. G. Bartell (L. V.), T. N. Charles (C. N. O. & T. P.), E. G. Hawkins (N. Y. C. & H. R.), A. B. Himes (B. & O.), J. Fred Jacobs (C. R. R. of N. J.), T. L. Johnson (D. L. & W.), F. A. Purdy (O. S. L.), A. H. McKeen (O. W. R. R. & N. Co.), T. J. O'Meara (N. Y. C. & H. R.), John Parker (N. Y. C. & H. R.), and A. H. Yocum (P. & R.)

Discussion on Storage Battery and Charging Equipment.

R. B. Elsworth (N. Y. C. & H. R.): The report of the committee on the first three pages on storage battery jars, sand trays and covers, is a progress report. The manufacturers have requested that the size of the jar be increased. There are two sets of dimensions which the manufacturers have been crying for, different manufacturers towards different sets and the committee has been trying to get them to decide the best dimensions. The committee is inclined to recommend the second set of sizes mentioned.

(A motion to adopt plan 1340 was put to vote and carried.)

Mr. Elsworth: I move that Plan 1341, relating to the storage battery separator be approved for action in October.

H. E. Beck (Storage Battery Company): In the table it is stated under H, which gives the number of intermediate posts, that in the larger sizes there are two intermediate posts, making a total of four. In our experience it is much safer to have an odd number of dowels in the separator, so that there is always one dowel in the middle, so that where the plate buckles or bends for any reason the larger pins are at the sides of the plate and at the center. If we have four dowels there is really less protection than three. We consider the proper design to be the three dowels or five dowels. The number depends on the type of plate. We use three dowls with a stiff plate and five dowels with the soft plate.

Mr. Elsworth: I believe it would be proper to accept the drawing with this additional information.

(The motion was put on the adoption of drawing 1341 and it was carried.)

Mr. Elsworth: I move that plan 1241, relating to the lead elements be approved for action in October.

(The motion was put to vote and carried.)

Mr. Elsworth: I move that this section on Jelly Electrolyte of the report be accepted for final action in October.

L. R. Mann: The report says that the specific gravity should be 1800, in the third paragraph. That should be 1080.

It is evidently an error. As this report is to be published as information, I would ask the committee why it recommends "battery should be taken apart, cleaned and charged with sulphuric acid about every two years and jelly electrolyte renewed."

G. E. Beck: At a conference with the battery representatives, we were advised that this should be done to get the full chemical action on the plates, to remove the sediments and renew the electrolyte.

L. R. Mann: I move that the last two paragraphs of the report be eliminated.

Mr. Elsworth: We have simply based our report on the best information we could procure.

Mr. Beaumont: The committee evidently is not justified in making the recommendation. The subject is an important one and one road is using the jelly electrotype. I do not think it would be well to include, under these circumstances, the last two paragraphs, for the reason that they discredit the practice on a line which is probably made more thorough investigation than the committee. I move that the matter be referred back to the committee to make a more detailed investigation and report.

(This motion was carried.)

T. J. O'Meara (N. Y. C. & H. R.): The next subject in the report is "Specifications for Electrolyte for Lead Type Storage Battery." I move the specification be accepted. This matter has been gone over by chemists and engineers, the Lehigh Valley, the Lake Shore and the New York Central Railway, and in a somewhat modified form has been submitted to battery manufacturers, and they have approved the form of this report.

(Various criticisms were made to this section, which the committee accepted for their final report.)

Mr. Elsworth: The next portion of the report relates to the "Specification for Edison Storage Battery."

Mr. Beck: I moved that this be accepted for action at the October meeting.

Mr. Anthony: Is a specification for this battery necessary? Here is a battery made by only one manufacturer. If we want an Edison storage battery we have to take an Edison battery as it is made.

Mr. Elliott: In the interest of fairness to the committee, this specification prescribes certain tests, which it seems to me would be enough to show that the battery was properly made and in good condition, and that it would be wise, in purchasing a large order of cells, to have these tests made.

E. B. Smith: Do you think the battery should be shipped charged or otherwise?

President Patenall: The committee seems to think the battery should be shipped charged.

Mr. Elliott: I move the adoption of this specification, subject to change at the October meeting.

Mr. Waldron: Does the committee intend to include the switches for charging and discharging the batteries?

Mr. Elsworth: I will say that that is simply progress. If we can go that far, we will do so.

President Patenall: I will put the motion as presented, that these plans be presented for approval at the annual meeting.

(The motion was carried.)

SIGNALING PRACTICE

The committee submitted as information, the results of tests of creosote used in treating cross ties and tests of cross ties treated with Carbondale creosote, supplemented by three diagrams.

In connection with the subject of economics of signal maintenance and operation, the committee submitted a report entitled: "Economics of Labor in Signal Maintenance."

The committee consists of T. S. Stevens, chairman (A. T. & S. F.); C. C. Anthony, vice-chairman (P. R. R.); H. S. Balliet (N. Y. C. & H. R.), C. A. Christofferson (N. P.), C. E. Denney (L. S. & M. S.), C. A. Dunham (Gt. Northern), W. J. Eck (Southern), W. H. Elliott (N. Y. C. & H. R.), G. E. Ellis (K. C. T.), A. S. Ingalls (M. P.), J. C. Mock (M. C.), F. P. Patenall (B. & O.), J. A. Peabody (C. & N. W.), A. H. Rudd (P. R. R.), W. B. Scott (S. P. R. R. Atl. Sys.), and A. G. Shaver (C. R. I. & P.)

Discussion on Signaling Practice.

C. C. Anthony presented the report of the committee and continued as follows:

There is a slight error in the report, at the bottom of page 3, where it is stated, "Your committee under instructions (a) presents the following tests." Instruction (a) is "recommend aspect for instructions to trains to take siding at a non-interlocked switch." The committee is working on other subjects and expects to have a further report in June. I will move that the matter presented at this time be accepted as information. That includes the tests on treated ties and report on the economics of labor.

(The motion was seconded and carried.)

W. M. Vandersluis (I. C.): We have 43 miles of double-track Hall gas and danger signals, being maintained by the section foremen. Originally there were eleven foremen, ten having four-mile districts and the others short districts. When this was put into effect they were each given an assistant foreman. The assistant foreman was to give his attention to the maintenance of signals proper. This was put into effect without very much instruction being given to the section foremen, and the results were not very good. We have lately put on these 43 miles an assistant signal supervisor, reporting to the track supervisor, who has charge of the instruction of these men. We have tried to keep the section foremen in their territories and to keep such men as showed some fitness for that work. It appears to be costing us more money, and we do not know how much of the time these men are being taken away from their regular track work.

Mr. Elliott: As confirming the conclusions arrived at in the third paragraph of page 13, the report of the Engineering Association Committee on this subject would seem to bear out the conclusions of this committee that successful results, except on one railroad, had not been obtained by combining the signal and the track forces.

T. S. STEVENS,
Chairman Committee on Signaling Practice.

Mr. Beaumont: While I have no definite authority that I can quote for this statement, I think it can be accepted as a fact that the economy effected on the one road by the joint organization was due to the introduction of the motor car rather than the change in consolidation of organization.

(The report of the Committee was accepted as information.)

STANDARD DESIGNS

The committee presented a number of drawings in order to bring out a discussion that would guide the committee in the further work of submitting designs that would be accepted as standard. Drawings indicated as Exhibts 1 and 2 show flat switch rods, wrought iron lugs of the socket type, and wrought iron adjustment brackets.

Exhibit 3-a shows an assembly of interlocking switch fittings. Exhibit 3-b shows the detail of the fittings that make up the front and lock rods for Exhibit 3-a.

Exhibit 4 shows a side connected lock rod connected by means of a screw jaw.

Exhibit 5 shows an assembly of the fittings the signal companies usually install for railroads when not otherwise directed by specifications and drawings.

The committee also presented drawing, 1049, showing details and assembly of adjustable lamp bracket; drawing 1070 showing representation of binding post which supersedes the one shown in the previous issue; drawing 1094, one-inch pipe line insulation superseding that adopted in 1901; drawing 1231, vertical type one-way pipe compensator; drawing 1236,

two-way (single lamp) train order signal; drawing 1238, detail and assembly of marker lights.

The committee consists of J. C. Mock, chairman (M. C.); C. C. Anthony, vice-chairman (P. R. R.), G. E. Ellis (K. C. T), F. P. Patenall (B. & O.), W. A. Hanert (N. Y. C. & H. R.), F. W. Pfleging (U. P.), C. J. Kelloway (A. C. L.) M. E. Smith (D. L. & W.), and R. E. Trout (St. L. & S. F.)

Discussion on Standard Designs.

Mr. J. C. Mock, the Chairman of the Committee, outlined the report of the committee in the abstract, and spoke as follows: The first five exhibits would probably be discussed as to the matter of preference. We don't want you to adopt all of them, but we want you to adopt one.

Mr. Denney: The first three plates have the lock rod fastened by a bolt or double nut arrangement, which will prevent lost motion developing and resultant difficulty in maintaining tight adjustment of lock rod. I move that it is the sense of this meeting that Plates 1, 2 and 3 (a), on account of the method of connecting the lock rod, have advantages over Exhibits 4 and 5, and would eliminate the last two.

(The motion was carried.)

Mr. Anthony: The first two exhibits show flat rods, with the socket type of switch foot. While there is very little threading, there is a pin connection on the front rod to point;

J. C. MOCK,
Chairman Committee on Standard Designs.

whereas in 3 (a) the front rod is rigid, no pins or bolts, but it has a screw jaw, and is threaded most of the way.

Mr. Denney: From an interlocking standpoint, I don't believe there is very much to be said in favor of one of these that could not be said in favor of the other.

Mr. Elliott: There is one point that in my opinion shows that plan 3 (a) is not as desirable as 1 and 2; that is that the front rod, while forming a solid piece between the rail lock and one part of the rod, is jointed, and the two parts are held together by an adjusting screw. Such construction is very much stiffer, preventing the ordinary movement of the switch point, and at the same time does not give the vertical support to the point to keep it from turning, which is the important point in keeping a good adjustment of the switch and making the maintenance easy. It is evident from a careful consderation of the two forms of front rods that the arrangement 3 (a) will not keep the point in a vertical position with nearly the support that the other two forms of rods do. For this reason I move that plans 1 and 2 be considered, and 3 (a) eliminated.

Mr. Shaver: I doubt the advisability of using a pipe connection as shown for the control rod. In many situations pipe rusts through very rapidly. I believe a solid rod is better. With reference to Exhibit 3 (a), I have had some circulars from manufacturers, which lead me to believe that that layout was patented. It might be well for the Committee to look that out.

Mr. Anthony: I think we are not discussing the design of lock rod or facing point lock casting. It is a question whether we shall use a front flat rod with adjustment brackets, something as shown after the style of the front equipment on Exhibit 3 (b).

Mr. Denney: It is the practice in some places to use only the one plate, but Exhibits 1 and 2 show four plates to assist the through bracing and the lock tie plates, the length being provided only to keep the lag screws from being close together on the same plane. I feel satisfied that the arrangement shown, with that number of plates or even less, but not with only one, will hold just as well as if it was a solid tie plate or one insulator.

B. H. Mann: I want to ask the committee about No. 1 as against Nos. 2 and 3. The feature in No. 1 seems to be a rather rigid connection, so there is very little opportunity, except in very high class track, for lengthwise switching, you might say.

Mr. Mock: In No. 1 we throw the plate for the facing point lock to about two feet three. That, in practice, gives us a perfectly good locking, with about two inches and a quarter run of either or both of the points. That is about the limit. When you come to No. 2, by the time the point has run 2½ in. you are over against the next tie, or very nearly so, so that there will be a bending between the lock rod and the bolt rod, if you have all of the equipment.

Mr. Dryden: In the lock rod we are undoubtedly taking a step backwards. This was the standard of the Baltimore & Ohio up to about ten years ago, and we found from experience it was impossible to obtain a good switch lock. Perhaps the use of the two bolt socket would at this time be of some assistance in preventing the turning of the switch point. If the socket is carefully made and machined and two bolts used, it may be possible to obtain a good switch lock. Otherwise it is impossible. I know it is a fact that enclosed switch If the socket is carefully made and machined and two bolts adjustments are patented. I would certainly recommend that an enclosed adjustment be used.

Mr. Mock: I haven't the slightest doubt but what 3 (a) is entirely satisfactory, because the Pennsylvania Railroad has been using it for three years.

Mr. Dunham. We have had experience, under heavy traffic conditions, of finding it practically impossible to maintain the track at proper gage with cut gage plates, and we have substituted insulated gage plates for cut plates formerly in use. This applied to four tower interlockings, and the change was made about four years ago. Notwithstanding the fact that the traffic is heavy, we have had no trouble in the breaking down of the insulations in the gage plates. In regard to Exhibit 3 (a), this impresses me as not being particularly good, because only one gage plate is shown. I believe about all of the roads have commenced to use at least 3-in. plates on their switching interlocking plants.

Mr. Mock: I would suggest, if there is no further advice that the members desire to offer, that we go slow on this matter. I suppose some of those who have not seen such equipment at the switch and are not familiar with it, should take a chance on one or two switches. Suppose you put in a couple of switches like No. 1 and a couple like No. 3, and see which you like best. I will do that. You can obtain these parts, as they are not special parts in the sense that you have to order them. The Pennsylvania company have used these by the hundreds. They are easily obtained.

SIGNALING REQUIREMENTS OF ELECTRIC RAILWAYS

The committee submitted as information aspects and rules which have been adopted by the American Electric Railway Association, and recommended for adoption as standard the aspects for trolley contact shown in Fig. 1 of the drawings presented.

The committee also submitted a number of definitions and other information on signal indications and general signal rules.

The form used on electric railways to report the failure of a signal was also submitted for discussion.

Data covering installations made on electric railways through the year from July 1, 1912, to July 1, 1913, was also submitted.

The committee consists of J. M. Waldron, chairman (I. R. T.); R. C. Johnson (B. R. T.); John Leisenring (I. T. Co.), and C. H. Morrison (N. Y. N. H. & H.)

(The report was accepted as information and the committee given the thanks of the association.)

SIGNALING IN THE SOUTHWEST

The committee submitted a preliminary report, stating that one general meeting has been held at Dallas, Texas, on November 25, 1913, with five members present. At this meeting

the committee work was organized and duties assigned the different members.

At the meeting held January 7, in Galveston, Texas, only three members were present and not much work was accomplished.

The last committee meeting before this convention was held February 12 at Houston, Texas, and an attempt was made to cover some of the assigned subjects in order to make a good progress report.

The committee consists of D. R. Morris, chairman (E. P. & S. W.); J. A. Johnson, vice-chairman (M. K. & T.); S. M. Bates (St. L. & S. F.), Paul A. Bliss (S. P.), E. Hanson (G. C. & S. F.), B. F. Hines (N. O. & N. E.), T. S. Jobson (G. H. & S. A.), D. W. Rosenzweig (S. P.), E. P. Weatherby (T. & P), and E. E. Worthing (S. P.)

SUBJECTS AND DEFINITIONS

The committee submitted a number of definitions of technical terms connected with signaling, particularly terms which discussions show are not properly defined. In view of the fact that there was not sufficient time at this meeting to

E. G. STRADLING,
Chairman Committee on Subjects and Definitions.

permit much discussion on these definitions the committee requested that members submit their criticisms to the chairman.

The committee consists of E. G. Stradling, chairman (C. I. & L.); R. H. White, vice-chairman; P. M. Gault (I. C.), and C. G. Stecher (C. & N. W.)

WESTERN RAILWAY CLUB MEETING TONIGHT

The monthly meeting of the Western Railway Club will be held in the Assembly hall of the Karpen building (twelfth floor) at 8 o'clock this evening. Prof. L. E. Endsley of Purdue University will read a paper on a "Report of Tests to Determine the Stress in the Plate of Cast Iron Wheels Due to the Heat Produced by the Brake Shoe."

PRESIDENT WENDT'S DINNER

President Wendt gave an informal dinner at the Union League Club last evening to the officers and members of the board of direction of the American Railway Engineering Association and a few guests. The party included W. B. Storey, Robert Trimble, William McNab, L. C. Fritch, W. C. Cushing, Charles S. Churchill, G. H. Bremner, A. W. Johnstone, J. A. Atwood, A. S. Baldwin, C. F. Loweth, W. L. Darling, F. A. Delano, W. B. Scott, C. A. Morse, A. K. Shurtleff, John G. Sullivan, E. H. Fritch, George Stanton, J. B. Cox, W. D. Pence, F. R. Coates, W. F. Schleiter, E. H. Lee, W. A. Christian, J. P. Snow, H. R. Safford, W. A. Wallace, J. B. Berry, W. G. Besler, George W. Kittredge, John F. Wallace, Howard G. Kelley, Hunter McDonald, W. S. Kinnear, A. W. Thompson, E. L. Dawes, W. J. Clark and Frank S. Mitchell.

MEMBERSHIP OF PUBLIC OFFICIALS IN THE R. S, A.

Secretary Rosenberg made the following statement yesterday:

"A question has come up as to the status of those members of the Association, who have become identified with federal and state commissions, and others who hold appointments outside of the railroad field. The board of directors has passed the following rule:

" 'The interpretation of the constitution, as understood by the board, would be that those members who are active members at the time such change is made would continue to hold active membership in this association. In case of those who were not active members, it would be necessary for them to be placed in the associate list until such time as the constitution could be changed.' "

CHICAGO ENGINEERS' CLUB INVITATION

The Chicago Engineers' Club extends to all visiting members of the American Railway Engineering Association the courtesies of the club during this week. The club is located at 314 South Federal street. Guest cards may be obtained upon application to the secretary, C. H. Norwood, 417 South Dearborn street.

HOW TO GET TO THE COLISEUM

Free transportation between the Auditorium, Congress and Blackstone hotels and the Coliseum is available to all those possessing badges, passes, or railroad passes. The two motor buses will travel continually back and forth between these places. It is impossible to schedule the trips because of the large number of people who must be transported. Good service may also be had on the street car lines on Wabash avenue, one block west of the Congress Hotel.

DINNER TO APPLIANCES ASSOCIATION DIRECTORS

Following the precedent set by Robert E. Belknap two years ago, and followed by A. P. Van Schaick last year, Tom R. Wyles, president of the National Railway Appliances Association last night gave a dinner at the Union League Club to the directors of the association and Secretary Crandall. Those present were N. M. Hench, John N. Reynolds, A. P. Van Schaick, C. W. Kelly, E. E. Hudson, H. M. Sperry, Philip W. Moore, E. H. Bell and J. Alexander Brown. After the dinner affairs of the association were talked over in an informal manner.

CHICAGO TERMINAL ORDINANCES REPORTED TO COUNCIL

The Chicago city council committee on railway terminals at last night's meeting of the council reported the ordinances providing for the erection of the new Union Station and the Pennsylvania freight terminal which it has had under consideration for many months. The passenger terminal to be occupied by the Pennsylvania Lines, the Chicago Burlington & Quincy and the Chicago, Milwaukee & St. Paul, is to be located between Jackson, Adams, Canal and Clinton streets. The freight terminal is to be between Canal street and the Chicago river south of Polk street. The council took no action, but deferred consideration of the ordinances for one week.

REGISTRATION—RAILWAY SIGNAL ASSOCIATION

ACTIVE MEMBERS.

Adams, E. L., Asst. Sig. Engr., L. S. & M. S. Ry., Cleveland, O.
Allen, W. P., Inspr. of Sigs., P. R. R., Philadelphia, Pa.
Ambach, E. T., Asst. Sig. Engr., B. & O. S. W. R. R. & C., H. & D. R. R., Cincinnati, O.
Anderson, B. T., Asst. Sig. Engr., A., T. & S. F. Ry., Topeka, Kan.
Anderson, James, Sig. Inspr., L. S. & M. S. Ry., Cleveland, O.
Anthony, C. C., Past President, Asst. Sig. Engr., P. R. R. Philadelphia, Pa.
Barnes, Osgood F., Trainmaster, Erie R. R., Susquehanna, Pa.
Baugh, F. E., Sig. Supr., Mo. Pac. Ry., Chester, Ill.
Bears, Alfred M., Sig. Supr., Can. Pac. Ry., Winnipeg, Canada.
Beaumont, J., Director, Sig. Engr., C. G. W. Ry., Chicago, Ill.
Beck, Geo. E., Chf. Sig. Inspr., L. S. & M. S. Ry., Cleveland, O.
Beoddy, J. A., Gen. Sig. Inspr., N. & W. Ry., Roanoke, Va.
Black, E. A., Supr. Sigs., L. S. & M. S. Ry., Ashtabula, Ohio.
Brown, Larsen, Gen. Sig. For., A. T. & S. F. Ry., Topeka, Kan.
Brundige, M. J., Sig. Supr., B., R. & P. Ry., Warsaw, N. Y.
Case, D. M., Supt. of Sigs., C., N. O. & T. P. Ry., Lexington, Ky.
Christofferson, C. A., Sig. Engr., Northern Pacific Ry., St. Paul, Minn.
Cormick, James H., Sig. Engr., Can. Northern Ry., Winnipeg, Man.
Cotton, Chas. A., Div. Sig. For., A., T. & S. F. Ry., Chilicothe, Ill.
Cowherd, G. R., Sig. Supr., A., T. & S. F. Ry., La Junta, Colo.
Davis, R. L., Office Engr., M. C. R. R., Detroit, Mich.
Dawley, W. M., Engr., Erie R. R., New York, N. Y.
Dawson, Wm. Asst. Supr. Sigs., L. S. & M. S. Ry., Chicago, Ill.
Denney, C. E., Past President, Spec. Engr., N. Y. Central Lines, Chicago, Ill.
Drake, Caleb, Gen. Sig. Inspr., C. & N. W. Ry., Chicago, Ill
Dryden, G. H., Prin. Asst. Sig. Engr., B. & O. R. R., Baltimore, Md.
Duffy, C. M., Sig. Supr., C., R. I. & P. Ry., Rock Island, Ill.
Dunham, Chas. A., Director, Sig. Engr., Great Northern Ry., St. Paul Minn.
Eck, W. J., Vice-President, Sig. and Elec. Engr., Southern Ry., Washington, D. C.
Elder, J. D., Asst. Constr. Engr., Detroit River Tunnel Co., Detroit, Mich.
Elliott, W. H., Director, Sig. Engr., N. Y. C. & H. R. R. R., Albany, N. Y.
Ellis, E. F., Supr. Sigs., C., C. C. & St. L. Ry., Mt. Carmel, Ill.
Ellis, G. E., Sig. Engr., Kansas City Term. Ry. Co., Kansas City, Mo.
Elsworth, R. B. Engr. Maint. of Sigs., N. Y. C. & H. R. R. R., Albany, N. Y.
Etters, Paul M., Asst. Supr. of Sigs., P. R. R., Altoona, Pa.
Finch, J. C., Inspr. Sigs., Mo. Pac. R. R., St. Louis, Mo.
Folley, E., Sig. Supr., C. & E. I. R. R., Evansville, Ind.
Foster, Franklin C., Sig. Supr., E. J. & E. Ry., Joliet, Ill.
Fox, M. J., Asst. Sig. Engr., C., B. & Q. R. R., Lincoln, Neb.
Frantzen, Oswald, Supr. Sigs., N. Y., N. H. & H. R. R., Boston, Mass.
Fugina, A. R., Director, Sig. Engr., L. & N. R. R., Louisville, Ky.
Gallagher, E. B., Sig. Inspr., Ill. Cent. R. R., Chicago, Ill.
Gault, Paul M., Div. Sig. For., Ill. Cent. R. R., Champaign, Ill.
Gensheimer, J. S., Asst. Supr. Sigs., P. R. R., Altoona, Pa.
Gray, G. B., Sig. Inspr., Penna Lines West, Pittsburgh, Pa.
Green, R. E., Asst. Sig. Engr., M. C. R. R., Detroit, Mich.
Harris, Marshal, Supr. Sigs., N. & W. Ry., Roanoke, Va.
Hastings, W. R., Asst. Sig. Engr., C., R. I. & P. Ry., Des Moines, Iowa.
Hawkins, E. G., Power Engr., N. Y. C. & H. R. R. R., Albany, N. Y.
Hiles, Wm., Inspr. of Sigs., C., C. C. & St. L. Ry., Cincinnati, O.
Hill, A. C., Sig. Supr., B. & A. R. R., Springfield, Mass.
Himes, A. B., Asst. Engr., B. & O. R. R., Baltimore, Md.
Hinton, K. A., Sig. Supr., C., H. & D. Ry., Indianapolis, Ind.
Hobson, Harry, Sig. Supr., A., T. & S. F. Ry., Topeka Kan.
Hodgdon, C. R., Sig. Engr., Canadian Pac. Ry., Winnipeg, Can.
Hovey, M. H., Consulting Sig. Engr., Madison, Wis.
Hulsizer, G. W., Sig. Engr., C. & A. Ry., Bloomington, Ill.
Inwood, T. G., Asst. Supr. Sigs., L. S. & M. S. Ry., Elkhart, Ind.
Irwin, J. C., care of Chief Engr., B. & A. R. R., Boston, Mass.
Johnson, R. C., Director, Sig. Engr., B. R. T. System, Brooklyn, N. Y.
Kelley, Arthur J., Sig. Supr., C., C., C. & St. L. Ry., Indianapolis Ind.
Kelloway, C. J. Sig. Engr., Atlantic Coast Line, Wilmington, N. C.
Killian, H. L., Asst. Supr. Sigs., L. S. & M. S. Ry., Toledo, O.
Kirkpatrick, T. E., Supr. Sigs., L. S. & M. S. Ry,, Elkhart, Ind.
Kolb, E. W., Director, Sig. Engr., B., R. & P. Ry., Rochester, N. Y.
Kydd, Geo. W., Supr. Sigs., Cin. Term Div., B. & O. S. W. R. R., Cincinnati, O.
Lavarack, Percy, Supr. Sigs., Penna. Lines West, Newcastle, Pa.
Lee, Frank, Prin. Asst. Engr., Canadian Pac. Ry., Winnipeg, Man.
Leisenring, John, Sig. Engr., Illinois Traction Co., Springfield, Ill.
Lomas, H. F., Asst. Sig. Engr., I. C. R. R., Chicago, Ill.
Lorenzen, H. C., Constr. Engr., N. Y. C. & H. R. R. R., Albany, N. Y.
Lowry, H. K., Prin. Asst. Sig. Engr., C., R. I. & P. Ry., Chicago, Ill.
Lundy, B. A., Asst. Sig. Engr., N. Y. C. & H. R. R. R., Albany, N. Y.
Lutz, T. E., Supr. Sigs., C., C., C. & St. L. Ry., Galion, O.
McCauley, C. G., Supr. Sigs., Washington Terminal Co., Washington, D. C.
McGill, J. P., Supr. Sigs., C., C., C. & St. L. Ry., Mattoon, Ill.
Mack, E. E., Supr. Sigs., C. & E. I. R. R., Salem, Ill.
Mann, B. H., Past President, Sig. Engr., Mo. Pac. R. R., St. Louis, Mo.
Manuel, W. N., Sig. Supr., G. R. & I. R. R., Grand Rapids, Mich.
Meisel, Benjamin W., Asst. Engr., Sig. Dept., C. & N. W. Ry., Chicago, Ill.
Mill, J. C., Sig. Engr., C. M. & St. P. Ry., Milwaukee, Wis.
Miskelly, Samuel, Gen. Sig. Inspr., C., R. I. & P. Ry., Chicago, Ill.
Mock, H. F., Sig. Inspr., C. & N. W. Ry., West Chicago, Ill.
Morkill R. F., Sig. Engr., Grand Trunk Ry., Montreal, Canada.
Morris, D. R., Sig. Engr., E. P. & S. W. Ry., El Paso, Tex.
Morrison, C. H., Sig. Engr., N. Y., N. H. & H. R. R., New Haven, Conn.
Motry, G. A., Sig. Inspr., B. & O. R. R., Baltimore, Md.
Mutchler, C. B., Sig. Engr., Grand Trunk Pac. Ry., Winnipeg, Man.
Newman, W. H., Supr. Sigs., N. Y. C. & H. R. R. R., Buffalo, N. Y.
O'Laughlin, W. M., Sig. Supr., N. Pac. Ry., St. Paul, Minn.
O'Meara, T. J., Chief Inspr., Sig. Dept., N. Y. C. & H. R. R. R., Albany, N. Y.
Oppelt, J. H., Supr. Interlocking, N. Y. C. & St. L. R. R., Bellevue, O.
Patenall, F. P., President, Sig. Engr., B. & O. R. R., Baltimore, Md.
Peabody, J. A., Sig. Engr., C. & N. W. Ry., Chicago, Ill.
Perrin, L. M., Sig. Supr., S. F. O. Term. Ry., Oakland, Cal.
Pflasterer, G. S., Sig. Engr., N. C. & St. L. Ry., Nashville, Tenn.
Pflasterer, H. B., Gen. Sig. For., N. C. & St. L. Ry., Nashville, Tenn.
Phillips, J. D., Supr. of Sigs., P. & R. Ry., Reading, Pa.
Phinney, R. M., Asst. Engr., Sig. Dept., C. & N. W. Ry., Chicago, Ill.
Porter, L. B., Asst. Sig. Engr., C. M. & St. P. Ry., Milwaukee Wis.
Pratt, Alfred, Erie R. R., Cleveland, O.
Raymer, I. S., Asst. Sig. Engr., P. & L. E. R. R., Pittsburgh, Pa.
Relph, E. J., Sig. Inspr., Northern Pacific Ry., St. Paul, Minn.
Rice, A. H., Sig. Engr., D. & H. Co., Albany, N. Y.
Robinson, Harry O., Sig. Supr., Mo. Pac. Ry., Washington, Mo.
Rose, L. S., Valuation Engr., C., C., C. & St. L. Ry., Cincinnati, Ohio.
Rosenberg, C. C., Secretary-Treasurer, Bethlehem, Pa.
Ross, Robert, Gen. Sig. For., Pere Marquette Ry., Grand Rapids, Mich.
Rudd, A. H., Sig. Engr., P. R. R., Philadelphia, Pa.
Saunders, J. E., Asst. Sig. Engr., D. L. & W. R. R., Hoboken, N. J.
Saunders, W. K., Supr. Sigs., R. F. & P. R. R., Ashland, Va.
Schultz, E. E., Asst. Supr. Sigs., C. & N. W. Ry., Chicago, Ill.
Scott, Thos. W., Sig. Engr., Maryland & Penna. R. R., Baltimore, Md.
Seifert, A. J., Sig. Supr., Penna. Lines West, Chicago, Ill.
Seifert, T. C., Sig. Inspr., C., B. & Q. R. R., Chicago, Ill.
Sharpley, H. F., Jr., Office Engr., Central of Georgia Ry., Savannah, Ga.
Shaver, A. G., Sig. Engr., C., R. I. & P. Ry., Chicago, Ill.
Smith, Chas., Gen. Sig. For., Can. Pac. Ry., Winnipeg, Can.
Smith, Earl B., Supr. Sigs., Elec. Div., N. Y. C. & H. R. R. R., New York, N. Y.

Smith, H. E., Gen. Sig. For., Nashville Terminals, Nashville, Tenn.
Sibila, W. C., Sig. Inspr., L. S. & M. S. Ry., Cleveland, O.
Smith, W. C., Inspr. of Sigs., Boston Elevated Ry., Charlestown, Mass.
Stephens, Chas., Sig. Engr., C. & O. Ry., Richmond, Va.
Stradling, E. G., Sig. Engr., C. I. & L. Ry., La Fayette, Ind.
Sutherland, M., Supr. Sigs., Maine Central R. R., Brunswick, Me.
Taylor, E. S., Asst. Sig. Engr., Can. Pac. Ry., Montreal, Can.
Taylor, R. W., Asst. Sig. Engr., B. & O. R. R., Baltimore, Md.
Tillett, C. H., Supr. Sigs., Grand Trunk Ry., Montreal, Que.
Trout, R. E., Director, Sig. Engr., Frisco System, Springfield, Mo.
Unger, O. R., Sig. Inspr., Mo. Pac. Ry., St. Louis, Mo.
Vandenburgh, E. C., Chf. Draftsman, Sig. Dept., C. & N. W. Ry., Chicago, Ill.
Vandersluis, W. M., Sig. Engr., I. C. R. R., Chicago, Ill.
Whitaker, A., Supr. Sigs., C., C. C. & St. L. Ry., Urbana, Ill.
Whitcomb, Fred E., Sig. Engr., B. & A. R. R., Boston, Mass.
Wiegand, F. B., Sig. Engr., L. S. & M. S. R. R., Cleveland, O.
Williams, John F., Sig. Supr., C., C., C. & St. L. Ry., Springfield, O.
Willis, W. H., Sig. Engr., Erie R. R., Jersey City, N. J.
Wilson, C. A., Gen. Sig. For., A. T. & S. F. Ry., North Chillicothe, Ill.
Woods, Leslie D., Sig. Supr., Mo. Pac. Ry., Little Rock, Ark.
Wyant, L., Supt. Sig. Const., C. R. I. & P. Ry., Chicago, Ill.
Young, J. V., Supt. Sigs., B. & M. R. R. and M. C. R. R., Boston, Mass.
Zane, Wm. F., Chf. Draftsman, Sig. Dept., C., B. & Q. R. R., Chicago, Ill.

JUNIOR MEMBERS.

Alexander, J. F., Sig. Constr. For., A. T. & S. F. Ry., Topeka, Kan.
Bird, J. C., Inspr., P. R. R., Wilkinsburg, Pa.
Cooley, C. T., Sig. Maint., L. S. & M. S. Ry., West Park, Ohio.
Mills, C. E., Sig. Maint., G. R. & I. R. R., Petoskey, Mich.
Spray, Lester E., Draftsman, Sig. Engr.'s Office, A., T. & S. F. Ry., Topeka, Kan.
Stanton, H. L., Sig. For., Penna. R. R., Newport, Pa.
Stoll, J. Geo., C., R. I. & P. Ry., Chicago, Ill.

ASSOCIATE MEMBERS.

Ames, Azel, Kerite Ins. Wire & Cable Co., New York, N. Y.
Arkenburgh, W. H., Adv. Mgr., U. S. & S. Co., Swissvale, Pa.
Bailey, C. C., Sig. Accessory Dept., General Electric Co., Schenectady, N. Y.
Beck, H. M., Engr., Electric Storage Battery Co., Chicago, Ill.
Bidwell, J. N., Eng. Dept., R. R. Com. of Wis., Madison, Wis.
Black, Robert, Vice-Pres. and Gen. Mgr., Dressel Ry. Lamp Works, New York, N. Y.
Brach, Leon St. Clair, Pres., L. S. Brach Supply Co., New York, N. Y.
Briney, M. R., Res. Mgr., General Railway Sig. Co., New York, N. Y.
Brixey, Richard, Pres. Kerite Ins. Wire & Cable Co., New York.
Brown, E. W., Salesman, Edison Mfg. Co., East Orange, N. J.
Bryant, Stanley C., Sig. Engr., Bryant Zinc Co., Chicago, Ill.
Cade, J. T., Vice-Pres., Federal Signal Co., New York, N. Y.
Cameron, F. C., Corning Glass Works, Corning, N. Y.
Camp, W. M., Editor, "Railway Review," Chicago, Ill.
Carter, P. E.
Coleman, W. W., Sales Engr., Edison Stor. Battery Co., Orange, N. J.
Corey, F. B., Union Switch & Signal Co., Swissvale, Pa.
Cozzens, J. J., U. S. & S. Co., New York, N. Y.
Day, S. M., Elec. Engr., Gen. Ry. Signal Co., Rochester, N. Y.
Dean, A., Jr., Res. Mgr., Union Switch & Signal Co., Chicago, Ill.
Dodgson, F. L., Cons. Engr., General Railway Signal Co., Rochester, N. Y.
DuBray, A. B., Sig. Engr., Missouri State Com., Jefferson City, Mo.
Edmunds, Frank W., Sales Agt., Dressel Ry. Lamp Works, New York, N. Y.
Gifford, H. E., Jr., Sales Mgr., National Elec. Spec. Co., Toledo, Ohio.
Gilman, Chas., East. Mgr., C. F. Massey Co., New York, N. Y.
Griffin, H. W., Engr., Union Switch & Signal Co., New York, N. Y.
Hackett, J. W., Sales Engr., Federal Signal Co., New York, N. Y.
Harkness, Wm. E., care of Hall Switch & Signal Co., New York, N. Y.
Harrington, C. O., Jr., care of U. S. & S. Co., Swissvale, Pa.
Hayes, S. W., Pres., Hayes Track Appliance Co., Richmond, Ind.
Henry, W. S., Prin. Asst. Engr., General Railway Signal Co., Rochester, N. Y.
Henze, C. D. A., Res. Mgr., Federal Signal Co., Chicago, Ill.
Howard, L. Frederic, Chief Engr., Union Switch & Signal Co., Swissvale, Pa.
Hudson, E. E., Vice-Pres., Thomas A. Edison, Inc., Orange, N. J.
Jacobs, Harry M., Sig. Accessory Dept., General Electric Co., Schenectady, N. Y.
Johnson, Sidney, Gen. Sales Mgr., Union Switch & Signal Co., New York, N. Y.
Jones, F. H., Res. Mgr., General Railway Signal Co., San Francisco, Cal.
Kearton, W., Sig. Engr., Minn. R. R. & Warehouse Com., St. Paul, Minn.
Kellogg, W. O., care of General Electric Co., Philadelphia, Pa.
Kinch, W. M., Sig. Engr., Gordon Primary Battery Co., New York, N. Y.
Kyle, W. T., Duplex Metals Co., New York, N. Y.
Lane, W. H., Chief Engr., Hall Switch & Signal Co., New York, N. Y.
Lavarack, W. W., care of Gen. Ry. Signal Co., Rochester, N. Y.
Lepreau, F. J., Asst. Western Sales Mgr., Thos. A. Edison, Inc., Chicago, Ill.
Lorenz, J. M., Salesman, Central Electric Co., Chicago, Ill.
Martin, L. G., Engr., The Okonite Co., New York, N. Y.
Martus, M. L., Sec. and Mgr., Waterbury Battery Co., Waterbury, Conn.
Massey, Chas. F., Pres., C. F. Massey Co., Chicago, Ill.
Moffett, F. W., Asst. Sales Mgr., Gen. Ry. Sig. Co., Rochester, N. Y.
Moore, Albert, Adv. Mgr., General Railway Sig. Co., Rochester, N. Y.
Murray, Wm. B., Mgr., Boston Office Jos. Dixon Crucible Co., Washington, D. C.
Nelson, G. A., Gen. Mgr., Gordon Primary Battery Co., New York, N. Y.
Nemitz, Fred H., Chief Draftsman, Illinois Iron & Bolt Co., Carpentersville, Ill.
Nolloth, Chas. S., F. D. Lawrence Electric Co., Cincinnati, O.
Parker, Thos. P., Sales Mfr., Canadian Concrete Products Co., Ltd., Chatham, Ont.
Pflasterer, C. S., Ry. Signal & Tel. Depts., National Carbon Co., Cleveland, O.
Pflasterer, W. R., Rep., Yale & Towne Mfg. Co., Chicago, Ill.
Poor, C. O., Asst. Res. Mgr., General Railway Signal Co., Chicago, Ill.
Schoenmehl, C. B., Waterbury Battery Co., Waterbury, Conn.
Simmen, P. J., care of Northey-Simmen Sig. Co., Indianapolis, Ind.
Smart, V. I., Prof. McGill University, Montreal, Que., Canada.
Sperry, H. M., Sales Mgr., General Railway Signal Co., Rochester, N. Y.
Swanson, C. E., Asst. Sales Agt., Hazard Mfg. Co., Pittsburgh, Pa.
Talbert, W. W., care of Union Switch & Signal Co., Chicago, Ill.
Taylor, H. B., Designing Engr., Hall Switch & Signal Co., Garwood, N. J.
Thomson, A., Jr., General Railway Signal Co., Rochester, N. Y.
Tureff, S. J., care of Federal Signal Co., Chicago, Ill.
Vogel, E. W., Pres., Chicago Railway Signal & Supply Co., Chicago, Ill.
White, F. J., Salesman, The Okonite Co., New York, N. Y.
White, Jas. W., Salesman, U. S. & S. Co., New York, N. Y.
Wight, S. N., Commercial Engr., General Railway Signal Co., Rochester, N. Y.
Willson, Edwin L., Sales Engr., Hazard Mfg. Co., New York, N. Y.
Winchell, B. L., Jr., Western Sales Mgr., Kerite Ins. Wire & Cable Co., Chicago, Ill.

ANNUAL MEETING OF APPLIANCES ASSOCIATION

The annual meeting of the National Railway Appliances Association will be held at 11 o'clock this morning in the large hall over the Coliseum Annex. Officers for the coming year will be elected; also two directors to serve three years. Reports will be presented by the officers and committees and it is desired to have a full discussion of all things pertaining to the welfare of the Association.

THE EXHIBIT

Compared with other exhibitions of railway appliances, held in connection with the meetings of railway associations, one cannot but be impressed with the business-like atmosphere which pervades the Coliseum and the First Regiment Armory. Comparatively little attention has been paid to providing comfortable and luxurious lounging quarters for the guests, although this feature has not been altogether overlooked, but much thought has been given to the arrangement of the individual exhibits —not to attract attention in a sensational way, but to show the devices so that the important advantages may be easily grasped and comprehended. From an educational and business standpoint the exhibit surpasses any of the five previous exhibitions. Not a single space is given over entirely to lounging or entertaining purposes. One innovation which will be appreciated is the space in the Coliseum Annex which has been fitted with writing desks, paper and ink for the convenience of visitors.

The signal exhibit is particularly noteworthy and, as in previous years, occupies the northern part of the Coliseum. Here may be seen in a most attractive form many of the latest and most important developments in the art of signaling. The improvements in the other exhibits, of interest to all of the branches of the railway engineering and maintenance department, are almost as noticeable. In the case of some of the devices, too large and extensive to place on exhibition and where photographs and drawings heretofore formed the exhibit, working models are now being shown, thus adding much to the value of the exhibit.

A few of the companies with large spaces have arranged to have the spaces extend from aisle to aisle, rather than lengthwise of the aisle, thus affording better opportunity to demonstrate their apparatus, without keeping visitors standing in the aisle and blocking it.

The exhibition of several car devices of special interest to mechanical department officers has excited some comment. Inquiry developed the fact that these particular exhibitors felt that the number of railway executive and mechanical department officers who will visit the Coliseum during the week will warrant this expenditure.

The artistic arrangement of the decorations is to be commended. The bronze colored columns with the burnished brass colored headpieces carrying the lighting fixtures; the bronze colored crossbars with the names of the exhibitors in uniform red and black letters; and the overhead decoration of United States flags and national colors, lend a dignified and delightful coloring effect to the general appearance of the exhibits. One visitor who had not attended the previous exhibit was so impressed as he entered the Coliseum that he stopped for a moment, and then exclaimed: "Wonderful! It truly forms a most impressive eulogy to the master minds who are working in the interests of railway efficiency."

In point of size the exhibit is about the same as last year. There are 160 exhibitors, with about 55,000 sq. ft. of space. Practically all of the available space in the Coliseum and Armory is taken. Considering that yesterday was the first day of the exhibit, the number of visitors was exceptionally large, and most gratifying.

No tickets are sold to the National Railway Appliances exhibit at the Coliseum. Complimentary tickets have been widely distributed. Badges of the A. R. E. A., R. S. A., and N. R. A. A. will be honored; also railroad passes or cards of railway employes. The aim is to exclude the general public, in order that railway men may have ample opportunity to study the exhibits under favorable conditions.

THE NATIONAL RAILWAY APPLIANCES ASSOCIATION

The National Railway Appliances Association, which has charge of the exhibit, and in general represents the interests of the railway supply industry at these conventions, as at present constituted, represents a development of eighteen years of steady growth in strength, numbers and influence. It is the outgrowth of the Road and Track Supply Association, organized in 1894, to exhibit at, and supply entertainment for, the Roadmasters' Association. In 1900 it transferred its attention to the American Railway Engineering and Maintenance of Way Association, now the American Railway Engineering Association. In 1910 the name was changed to the Railway Appliance Association, and in 1911 it was regularly incorporated under the laws of Illinois with its present name.

T. R. WYLES,
President.

The chief function of the association is to organize and conduct the exhibition of railway appliances held annually in the Coliseum and the First Regiment Armory, that is so important a feature of the engineering and signal association conventions.

The officers and members of the board of directors of the National Railway Appliances Association are: President, Tom R. Wyles, Detroit Graphite Company, Chicago; vice-president, N. M. Hench, Carnegie Steel Company, Pittsburgh, Pa.; treasurer, John N. Reynolds, Simmons-Boardman Publishing Company, Chicago; secretary, Bruce V. Crandall, Chicago; honorary director, A. P. Van Schaick, Lackawanna Steel Company, Chicago; directors, C. W. Kelly, Kelly-Derby Company, Chicago; E. E. Hudson, Thomas A. Edison, Inc., Orange, N. J.; H. M. Sperry, General Railway Signal Company, Rochester, N. Y.; Philip W. Moore, The P. & M. Co., Chicago; E. H. Bell, The Railroad Supply Company, Chicago; J. Alexander Brown, Pocket List of Railroad Officials, New York City. The photographs of all eleven are reproduced herewith.

N. M. HENCH,
Vice-President.

President Wyles is a director and has recently been elected vice-president of the Detroit Graphite Company, with offices in Chicago. He is a Canadian by birth and is 42 years of age. After leaving school, and until 1891,

E. H. BELL.

J. ALEXANDER BROWN.

H. M. SPERRY.

E. E. HUDSON.

P. W. MOORE.

C. W. KELLY.

B. V. CRANDALL,
Secretary.

A. P. VAN SCHAICK.

JOHN N. REYNOLDS,
Treasurer.

OFFICERS AND DIRECTORS OF THE NATIONAL RAILWAY APPLIANCES ASSOCIATION.

he worked in various capacities in Richmond, Va., and St. Louis, Mo. From 1891 to 1896 he was a stenographer in the purchasing department of the American Refrigerator Transit Company at St. Louis, and during the latter year was transferred to Chicago as contracting freight agent of the company. He resigned in 1897 to become agent for the Detroit Graphite Company, and was made second vice-president in 1907. About a month ago he was promoted to vice-president of the company.

N. M. Hench, vice-president, was graduated from Lafayette College, Easton, Pa., in 1897, and entered the service of the Pennsylvania Railroad in the maintenance of way department. He was promoted to supervisor of track within four years, and was last located at Altoona, Pa. In 1905 he resigned to accept the position of engineer of track appliances with the Carnegie Steel Company, Pittsburgh, Pa., which position he still holds. He was elected a director of the National Railway Appliances Association three years ago, and is also a member of the American Society of Civil Engineers and the American Electric Railway Association.

SPRINGLESS DIAL SCALE

An improved springless dial scale designed for rapid, accurate weighing has been produced recently by Fairbanks, Morse & Co., Chicago. The dial is provided with large, plain figures, and the pointer has a steady and rapid movement, even when subjected to jars, as in freight r

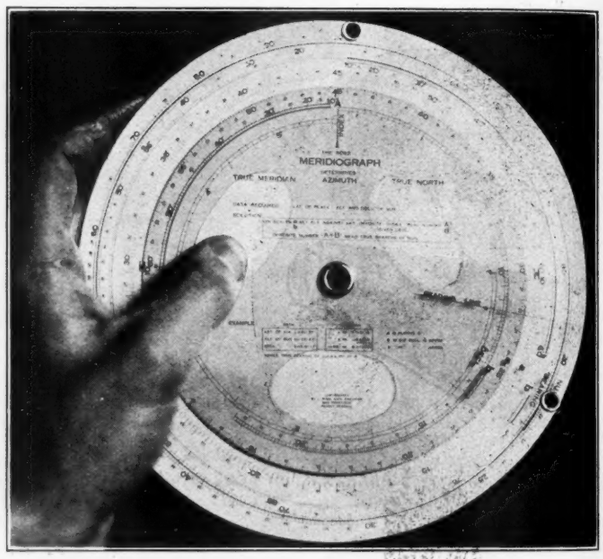
New Dial Scale.

baggage service. These features add materially to the accuracy of the scale, and the speed with which it can be used depends principally upon the rapidity with which goods can be handled to and from the platform. The accuracy of this scale can be easily checked at any point up to its limit by an auxiliary beam. On the 15-in. dial scale, with a face graduation of 1,000 lbs. in 5-lb. division, the auxiliary beam operates in conjunction with the indicator and gives an additional capacity of 4,000 lbs., allowing any amount up to 5,000 lbs. to be weighed within the limits of accuracy of the scale. A tare beam of 500 lbs. in 5-lb. divisions is also provided with the dial scale.

Although the dial itself is of a new design, it is so made that it may be attached to Fairbanks beams scales already in service, and may be substituted for the beam on any Fairbanks scale in good working order. In making such a substitution, the indicator is merely connected to the scale lever dispensing with the beam and pillar outfits. Springless dial scales of this new type have already been put in use by the New York, New Haven & Hartford, the Wabash, the Chicago & Eastern Illinois, the Chicago, Milwaukee & St. Paul, and the Chicago Junction. Installations are at present being made on a number of other roads.

THE MERIDIOGRAPH

Frequently, in making railroad and river surveys or surveys of public lands, it is necessary to determine a meridian accurately, and for this purpose the magnetic needle is frequently too inaccurate. To provide a means



The Meridiograph.

for determining a true north line quickly, the meridiograph has been devised. This consists of two circular scaled discs 7 in. in diameter, with a reading arm protected by a celluloid cover. The discs are graduated at intervals of from 5 to 10 minutes. To find the true north, the sun's altitude is measured with the ordinary surveying instruments, the declination is taken from the Solar Ephemeris, and the latitude of the station from a map. These data are set on the scales discs by means of the reading arm, thus solving directly the trigonometric equations of the solar spherical triangle involved, and giving accurately the bearing of the sun from the true north. This procedure requires only a few minutes in the field. The device can also be used in the office to check or reduce a solar observation. The meridiograph was devised by Louis Ross, 268 Market Street, San Francisco, Cal.

INFORMATION BUREAU

An information bureau is maintained in the office of the secretary of the National Railway Appliances Association at the Coliseum, space 185. This is just to the left of the main entrance on Wabash avenue.

Regulation of Railroads and Other Public Utilities

Abstracts of Three Papers Presented Last Night at Meeting of the Western Society of Engineers

The Western Society of Engineers devoted last evening to a discussion of the regulation of public utilities. Papers were read on "Regulation of Public Utilities from the Investor's Standpoint," by Andrew Cooke; "Valuation of Public Utilities from the Railroad Point of View," by Samuel O. Dunn, and "Valuation of Public Utilities from the Standpoint of the Public and the Engineer," by Harold Almert. An abstract of the papers follows:

FROM THE INVESTOR'S STANDPOINT

BY ANDREW COOKE.

For many months one of the most disturbing factors in the financial world has been the uncertainty caused by the failure of the Interstate Commerce Commission to render a decision on the application of the eastern railroads for an increase of five per cent in freight rates. It is conceded that public sentiment would not be opposed to an increase in rates, and yet the investigation of the Commission drags on. It goes without saying that there can be no great revival in general business until the railroads again come into the market as purchasers of materials and supplies.

One of the principal arguments advanced by those favoring this suggestion, and an argument which they claim more than offsets certain obvious and serious objections to government ownership, is that private corporations must pay a very much higher rate of interest upon capital than the government would be obliged to pay upon money borrowed for the purpose of purchasing and developing the railroad systems of the country.

If, therefore, a plan can be worked out whereby the interest rates which the companies are required to pay upon capital can be materially decreased under private ownership and government control, the principal arguments in favor of government ownership will have been answered.

Generally speaking, the rate of interest which an investor demands at any particular time varies according to the risk incident to the investment, and among the principal questions which must be considered in determining the risk involved in any railroad enterprise are the following: First, whether the company has been and will be honestly financed and managed; second, whether the company is protected against unexpected and unfair increases in taxes; third, whether there is a possibility of the construction of a competing road; and, fourth, whether there is a possibility of an unfair reduction in rates, or what amounts to the same thing, a prohibition against an increase in rates made necessary by advance in wages, the price of materials and supplies, and other expenses entering into the cost of transportation.

There is no excuse, of course, for the mismanagement of railroad properties which has recently been disclosed in certain cases. It is probably desirable to provide for the approval by the Interstate Commerce Commission of the issuance of railroad securities.

Under the present system, taxes must be paid before an investor in a property can receive any return upon his investment, and the risk assumed by investors is increased accordingly. If the system of taxation were changed so that the taxes assessed against a corporation would be payable only out of the surplus earnings remaining on hand after providing for operating expenses, full maintenance and depreciation charges, and a fair return upon the value of the property, an investment in the securities or stock of a railroad company would be much more attractive than it is at present.

One of the greatest dangers to which a railroad investment was formerly subject was that of the construction of competing lines, which resulted in disastrous rate cutting, and frequently in the sale of the properties at foreclosure. Fortunately, danger from that source has been very largely eliminated, owing to the passage of public utility laws in various states which provide that no new property shall be constructed unless the Public Service Commission hall have issued a permit showing that its construction is a public necessity. Certainly, if public utility regulation is to be favorably regarded by investors it must be a regulation, not only of rates, but of competition.

It is difficult to see how the rates of any railroad can be intelligently or fairly regulated unless the Interstate Commerce Commission shall first ascertain what is a fair valuation of the company's property on which it is entitled to receive a return.

Without entering into a discussion of the items which should be included in such valuations, it must be admitted that liberal allowance should be made for the cost of developing the busines of each company; that is, the loss in operation which may have been sustained in previous years, representing first the difference between a fair return upon the money invested, and the amount actually received in interest and dividends, and second the depreciation of the property not provided for out of earnings.

Suppose that instead of denying the companie's an increase in rates, the Interstate Commerce Commission should permit the railroads to increase rates to a point where net earnings would undoubtedly show a margin over the returns which the companies would be entitled to receive. The exact net earnings which would result from any increase allowed by the Commission could naturally not be determined in advance, but the Commission could order that if the net earnings exceeded a fair return, then the excess should be expended for safety devices, double tracking, additional equipment, terminals and other improvements, but that this expenditure should not be charged to capital accounts, and that the railroads should at no time in the future be allowed to receive any return thereon. The effect of such an attitude on the part of the Interstate Commerce Commission would be to place the railroads in such a secure position that new money could be obtained at a very much lower rate of interest than the companies are compelled to pay at present, and at the same time the public would be in no way injured.

It is not strange that under existing conditions American railroad securities do not have the high standing which they formerly had at home and in the financial center of Europe, and the excessive rates which the companies are obliged to pay for money at the present time is due to the unnecessary risk which an investor in railroad securities must assume, and which would practically be eliminated under a system of government regulation along the lines which we have mentioned. The rate of interest which must be paid on capital is one of the principal items in the cost of transportation, and it is, therefore, in the interest of the public to safeguard railroad investments in such a way that the rate paid upon capital can be reduced to the minimum. Under government regulation the public can secure the entire benefit of the saving in interest charges.

VALUATION FROM THE RAILWAY POINT OF VIEW

BY SAMUEL O. DUNN.

In spite of the title of my paper, I have no authority, implied or express, to speak for the railways. My role here was assigned me by those who extended the invitation.

The tap root of the theory of valuation is the provisions in

the fifth and fourteenth amendments, which in substance prohibit the nation or any state from taking private property for public use without due process of law and just compensation. To so regulate the rates of a concern in the supposed interest of the public as to destroy its fair present value to its owners is equivalent to taking the property without just compensation, and the courts have so held. Furthermore, the courts have clearly implied that the fair present value which the owners of a railway or other public utility are entitled to have protected when its rates are being regulated is, in essence, the same thing as the fair present value which they would be entitled to receive if their property were being taken by condemnation.

The Supreme Court has clearly indicated that no one of the numerous elements which it has mentioned should be considered alone. All of them should be considered, due weight being given to each; and the valuation finally made should be an estimate of value arrived at, not merely as a result of a process of inventorying and of mathematical calculation, but in the exercise of a fair and sound judgment.

There are some broad questions of public policy pertaining to valuation which are regarded by many as still open to discussion and on which I shall, therefore, venture briefly to touch. One of these is how land used for railway right-of-way and terminals should be appraised. It has been said that much of this land was donated by the government to the railways, and that as the railways are engaged in a public service they should not be allowed to benefit by the "unearned increment" in it.

As a matter of fact, the theory that the railways should not be allowed to benefit by the unearned increment in their land has not a leg to stand on. It is a misnomer to say that the so-called "land grant" land was donated. It was transferred to the railways as a result of contracts entered into between the government and the companies. The consideration paid by the railway companies was twofold. First, they agreed to build the railways, it being foreseen by everybody that this would benefit the government and the public by increasing the value of all the remaining land the government owned and by promoting the development of the country. Second—and this is a point often overlooked—the railways agreed to carry the mail and government troops, supplies, and so on, at reduced rates; and some of them have thereby paid to the government many times as much for the land as it was worth when it was granted to them and more even than it is worth now.

The grants having been made on these definite terms, and there having been nothing said or done at the time to indicate that the railways were not to benefit fully by the increase in the value of the land, on what basis of law—or of economics, equity or common sense, for that matter—can there be founded at this late day an argument to show that the land should not now be included in a valuation at its full present value? As to land which the railways have obtained from private owners, and which has since increased in value, it is inconceivable how any sane and fair man can contend that they are not entitled to benefit by the unearned increment in it.

Another important question connected with valuation regarding which there has been much discussion in newspapers and magazines, and some more or less significant discussion in reports of the Interstate Commerce Commission, is whether value created by the investment of earnings should be included in a valuation. The earnings which have been invested in railways are ordinarily referred to as "surplus earnings"; and it is commonly assumed that they have been earnings which the roads have had left after the payment of interest and reasonable dividends. This assumption is right as to some cases; wrong as to others.

If in both these cases the earnings in question belonged to the corporation, and, therefore, might have been paid out to the stockholders, upon what ground can it be contended that when the directors, instead, decided to and did invest them in the property they ceased to belong to the corporation, were transmuted into property of the public, and were thereby automatically excluded from consideration in a valuation of the railway? Suppose that these earnings had been paid out to the stockholders in dividends; that then the company had issued stock which the stockholders bought with these dividends; and that the money had then been invested in the property. The money thus paid out by the company to the stockholders, and paid back by them and invested, would have been the same money as that which was invested without having first been paid out and paid back. And yet if the business had been handled in that way, would anybody now question whether the part of the value created by that investment should be included in a valuation of the railways?

I now venture to touch on depreciation. A new rail has a certain value which is represented by the price that has been paid for it. As soon as it is laid the rail begins to depreciate in value. It may be just as good for immediate service at the end of a week or a year or two years as when it was laid. But everybody knows that its market value has declined and that its potential service has been reduced. Suppose, now, that when it has been in service for half its probable life a valuation is made. Should that rail be included as of the same value as a new rail? It seems manifest that a deduction from its value new should be made for and in proportion to its loss of potential service. If at the time a number of new cars or rails are put in service a depreciation fund be opened for them and payments be made into it on a proper basis, when those cars or rails are four years old there will be in the depreciation fund account an amount equivalent to the potential service which they have lost. If at that time a valuation of the railway be made and a deduction for the depreciation of these rails or cars be made, this deduction will be offset by the amount which has been paid into the depreciation account. The railway will then lose nothing by the deduction for depreciation. If, on the other hand, the railway, instead of paying into a depreciation account enough to offset the actual depreciation, has taken the money and done something else with it, has it any just ground for complaint if the regulating authority refuses to include in the valuation the equivalent of this money?

The question whether a deduction should be made for depreciation is on all fours with the question whether there should be included in the valuation the value created by investment from earnings. The value created by investment from earnings is there, and, being there, should be and must be counted. The value which has disappeared because of depreciation and of the failure to provide adequate depreciation or sinking funds, is gone, and, therefore, should not be counted.

A point in regard to the valuation of railways and other public utilities which has not received as much consideration as it deserves is the allowance, if any, which should be made for going value. It seems to be quite generally assumed that when the physical property has been inventoried, and all the items included in the cost of physical production or reproduction has been added up, the valuation is complete. But is a property a mere aggregation of physical units? Are land rails, ties, locomotives, cars, passenger stations to be considered as everything, and the traffic which has been built up and the organization and methods which have been developed for handling it to be treated as naught?

You might have running parallel to each other two roads which it had cost the same amount to produce and would cost the same amount to reproduce, but one of which would have vastly larger net earnings, and therefore, plainly, a far larger going value than the other. It may be said that there is no logical method of allowing in valuation of railways for going value and the good management which creates it. But the Washington Railroad Commission found a way to do it.

Furthermore, it is notable that when in Michigan, Texas and New Jersey valuations were made as a basis for taxation it was found possible to work out methods for computing the intangible, or "going," values of the railways, and that they were taxed on these intangible or going values. Certainly, if no allowance is to be made for going value in the valuation of railways, then some allowance should be made for it in determining the rate of return to be allowed to different railways on their mere physical valuations.

One of the most interesting of the questions that suggest themselves in connection with the valuation of railways which the Interstate Commerce Commission has begun is whether, when it is done, it will justify either a general advance or a general reduction of rates.

It is ordinarily assumed that a railway or other public utility which has been and is managed with ordinary prudence has a right to earn a return of not less than 6 per cent on a fair valuation. That this return is very moderate may be shown by a simple illustration. The press bulletin of the Interstate Commerce Commission giving preliminary statistics for the fiscal year 1912 for railways earning $100,000 gross or more shows that in that year the total net operating income of these railways was $755,869,486. This net operating income would have been 6 per cent on only $12,597,800,000, or on $52,400 a mile of line. Will the valuation, then, probably amount to more or less than $52,400 a mile?

The net capitalization per mile of the railways in 1911 was reported by the Interstate Commerce Commission as $64,000. The average gross capitalization in that year—in other words, the capitalization including all of the duplication caused by the intercorporate ownership of stocks and bonds—was $81,300 a mile. In other words, the amount on which the net operating income of 1912 would have amounted to a return of 6 per cent—namely, $52,400 a mile—was 35.5 per cent less than the gross capitalization in that year, 26.1 per cent less than the reported cost of road and equipment, and 22 per cent less than the net capitalization in 1911.

In spite of all the wild talk that there has been about watered railway capitalization, is there an engineer or a student of railway history and economics who really believes that the valuation of our railways will average as little as $52,400 a mile? It will not be surprising if it amounts to nearer $75,000 a mile. In any event, it appears as certain as any future thing can be that those who advocated a valuation of railways as a means of preventing advances in rates or even bringing about a reduction of them, are going to be utterly disappointed. By the same token, it appears clear that the managers of and investors in our railways, or at least most of them, may look forward to the results of the valuation with much ease and complacency, if not positive enthusiasm.

FROM THE STANDPOINT OF THE PUBLIC AND THE ENGINEER

BY HAROLD ALMERT.

The fact that nearly forty States have passed laws and created Public Utility Commissions to regulate public service corporations, and the further fact that legislation along the same line is pending in several other States proves, beyond the shadow of a doubt, that the American people are determined upon a readjustment of the relations existing between the Public and the public service corporations, and this situation constitutes the leading political issue in almost every State in the Union, and throughout most of the Provinces of Canada, at the present time.

The great majority of the public seems to be fair. Unfortunately this is not true with all, however; therefore everyone cannot be satisfied, and there will always be a certain element which will have a complaint to make regardless of what readjustment is finally made.

In the past, and even now, in most quarters the public has never been provided with accurate data regarding investment and earnings of the public utilities serving them, and where they have secured any figures at all, they have generally been those which appear either in the rosy prospectus written by the promotor, which are never realized, or from circulars of security brokers, which touch only lightly on past and present earnings and deal at length and lay great stress on expected future earnings, due to improved equipment or economies in managemnet, or both, and which statements frequently quote surplus earnings before or without making any deductions to provide for maintenance, renewals or depreciation of plant. The only figures, therefore, which have been available to the public in the past have been statements designed to impress them with the enormous earning possibilities of the undertakings, with the hope of inducing them to invest in the securities, and these data, while truthful enough on their face, do not tell the whole story of the cost of service. Is it surprising, then, if the uninformed or misinformed public believe that the profits of public service corporations are enormous and the rates charged for service excessive?

This failure on the part of the utilities to take the public, or their elected representatives, into their confidence and provide them with complete and accurate data regarding investment and earning is, no doubt, the primary cause for the recent wholesale legislation calling for the regulation of utilities. I know of no greater service which the daily press can render the public than to secure an unbiased, fully qualified writer with technical training to collect accurate data regarding operations and profits of public utilities and publish them in simple language, so that all who read may understand. Such information would, in a short time, clear the atmosphere and be a big step in the right direction, and would be a powerful influence in counteracting the great harm which is being done by unscrupulous agitators and reformers with ulterior motives.

The public's interest in this whole situation can be summed up in a few words. They want to be, and have a right to be, satisfied that they are securing good and adequate service at reasonable rates. To secure unbiased rulings on what is good and adequate service and what are reasonable rates, the jurisdiction must be removed beyond the influence of local prejudices and those passing judgment must be free from political interferences and prevented from using their office as stepping stones for gratifying political aspirations.

The correct solution of proper public relations is a complex question involving a mixture of engineering, accounting, law, finance and knowledge of and exercise of commercial and executive ability. The question is continually arising,—who is best qualified to get at the real facts? The courts show by the numerous decisions which have been handed down that they have not discovered the underlying principles, and while they do their level best in each case to arrive at a decision which is fair to all concerned, the lack of uniformity in conclusions shows that they are far from the correct, or even a reasonably satisfactory solution of the problem.

It is my belief that upon the engineer rests the responsibility, and with him lies the capacity, to render the largest public service possible at this time of any citizen in setting the law makers' and the consumers' fears of excessive profits at rest, and also aiding in securing the right for the public utility to earn a fair return, all hazards considered.

Discussion.

These papers were discussed by John W. Alvord, Wm. B. Jackson, Chairman Quan and Commissioner Shaw of the Illinois Public Utilities Commission, Lyman E. Cooley, Onward Bates and others.

SAFETY IN GANTRY CRANE DESIGN

A 20-ton gantry crane has recently been installed in the yards of the Canadian Pacific at Place Viger, Montreal, which was designed and built on the "safety first" principle, and possesses a number of improvements over the cranes commonly used. One of the important features in this design is the fact that the hoisting gearing on the trolley is enclosed in a pocket which is part of the trolley frame itself, thus insuring rigidity and alinement. The gears are enclosed collectively, as far as possible, so that a group of them can be run in a single lubricating chamber. The gear case is so designed that the gears must be enclosed in order to run at all. An added safety feature is provided in the guard in front of the truck wheels.

This crane has four motors wired for three-phase, 60-cycle, 550-volt alternating current. The span is 45 ft. 6 in., and the

C. P. R. Gantry Crane in Freight Yard.

lift 23 ft. The hoisting speeds are about 12 ft. per min. for the main hoist and 50 ft. per min. for the auxiliary hoist. The travel speed is 150 ft. per min. and the trolley travel speed 50 ft. per min. This crane was furnished by the Northern Engineering Works, Detroit, Mich.

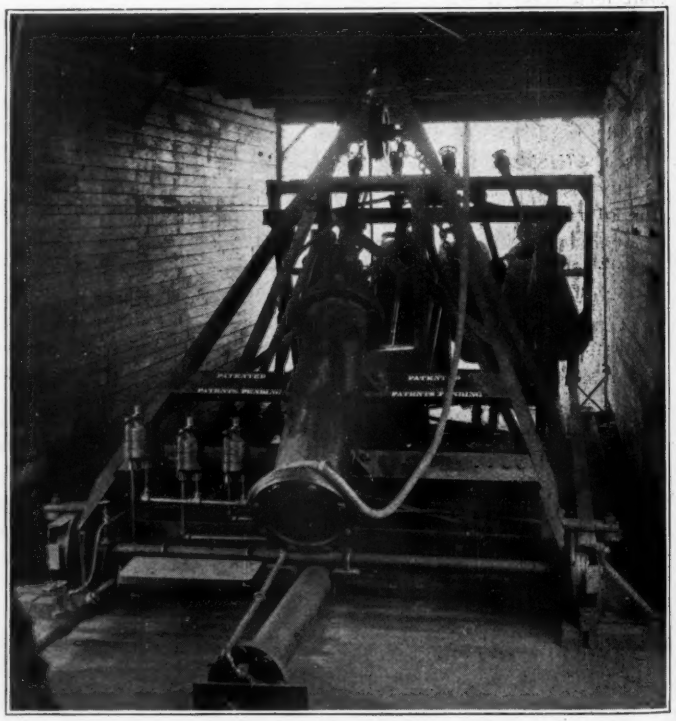
A GASOLINE WEED BURNER

A weed burner which utilizes a hot blast of gasoline vapor for killing the vegetation along the right of way has recently been placed on the market by the Lamb Railway Service Company, Cincinnati, O. A gasoline storage tank, generators, burners and all necessary controlling equipment are carried on a single car, which is pulled over the line by a locomotive. Only all-steel or steel-covered cars are used, and all machinery is completely enclosed to protect it from the weather and from disturbance when not in use.

The gasoline is stored in a heavy steel tank of ½-in. plate, triple riveted, located at the opposite end of the car from the burners. A capacity of 1,200 gal. is provided. This tank is also used as a receiver for compressed air. This gasoline is vaporized and burned in seven cast-iron cylindrical burners 16 in. in inside diameter, which are open at the end and pierced with holes to admit the required air. This battery of burners is mounted on a carriage which allows it to be projected from the rear end of the car. The carriage is built of structural steel and is operated on wheels confined in 12-in. channels, which keep the battery in place when in operation. This runway is of sufficient length to allow the battery to be extended 10 ft. from the car. The movement of the carriage and of the burners are controlled by compressed air cylinders supplied from the locomotive. The control arrangement allows the battery of burners to be raised or lowered at will, so that

Burners on Lamb Weed Burner in Operating Position.

the fire can be directed on the ground when burning vegetation, and into the air when passing over bridges, cattle guards, etc. The valves allow the operator to cut out one or more of the burners at any time. The gasoline is introduced into coils inside the burners in which gas is generated. These coils are made of double strength piping, in continuous lengths, to avoid cutting inside the generators, and are set in fire clay to prevent burning. The gas is forced from these coils through needle-point orifices by compressed air at a pressure of 100 lb. or more. The



Interior View of Lamb Weed Burner Car.

temperature of the flame is estimated to be as least 2,500 deg. F. The battery of burners covers a width of 12 ft. on the ground.

The consumption of gasoline at full power is 200 gal. per hour. The speed of burning is said to vary from 4 to 12 miles per hour, according to the character and age of the vegetation. It has been found that 50 miles per day can be burned when the growth is not too heavy and old. Extensive tests made with this car show that the cost of operating per mile for burning weeds, including motive power, fuel and attendants should not exceed $5. In addition to this cost a royalty is charged for the use of the apparatus, which is based on a sliding scale. Including the cost of operation and rental, the total is said to be less than $12 a mile. Although a moving flame will not ordinarily set fire to inflammable material on the track, it is considered best in the use of this burner, to have the section crew follow the car to put out any possible fires.

Numerous tests have been made recently of the availability of this burner for use in melting snow around frogs, switches and interlocking plants. These tests have shown that ice and snow can be removed quickly and the car can be moved from point to point without stopping the generation.

HAULING WINCH ON TURNTABLE TRACTOR

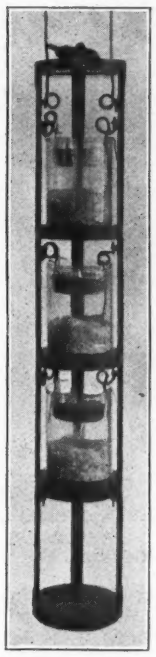
The Weir & Craig Manufacturing Company, Chicago, has recently designed a hauling winch for use with its type "D" turntable tractor, which is operated by the same motor used for the tractor. In some terminal layouts the coal and ashes must be handled across the turntable to and from the power

Turntable Tractor with Hauling Winch. Sides of Cab and Covers on Winch and Tractor Machinery Shown Removed.

house on tracks not in line with the through line to the table. In such cases this hauling winch supplements the switch engine in handling these cars. It is also considered advisable by many engineers to provide such a winch for hauling out dead engines from the roundhouse in case of fire or other emergency. In previous turntable designs it has been necessary to provide a separate motor in the center of the pit to drive a hauling winch if one was desired.

In the new model the winch is located in the "A" frame which forms a part of the tractor and all tractors of this type will be provided in the future with the proper bearing for mounting this winch if it is ever desired to add it after the tractor is in service. The operation of the winch is clearly shown in the accompanying photograph, which shows a portion of the cab and the cover for the operating machinery and winch removed. When in operation all machinery is completely enclosed. The additional mechanism required to operate the winch consists of clutches, a train of gears, the drum and cable. The outside bearing of the drum rests on a channel section spanning between the two members of the "A" frame, and this channel is provided with a stiff leg in the table to take the strain. The clutches are operated by a lever within the cab which is so arranged that the gears are always in mesh, either with the track wheel gears or the winch gears. This provision makes it impossible to operate both the tractor and the winch at the same time by mistake. The electrical equipment, gears and other parts have been altered somewhat to provide for the addition of the winch. The motor, which may be furnished to use either air or electricity, has been enlarged to a capacity of 30 h. p. and the drum accommodates from 500 to 600 ft. of 1-in. cable. The cable is reeved through sheaves placed on the turntable. The special features of this tractor, whic h is a comparatively recent development, were described in the RAILWAY AGE GAZETTE of July 11, 1913.

BUS BARS ON BATTERY CHUTE ELEVATORS



Battery Bus Bars.

An improvement in signal battery wiring has recently been made by the T. George Stiles Co., Arlington, N. J., by the application of bus bars to the side strips of the battery chute elevator. Wing nuts are provided on these bars to facilitate the connection of the battery cells in series with the lead wires.

This simple method of wiring makes it possible to remove any cell for recharging or cleaning without breaking the circuit at an inopportune moment, which often happens with the old method of wiring from cell to cell. The use of the bus bar also greatly reduces the number of wires and connections necessary in the battery chute.

In order to prevent any possible leakage of current by saturation, the woodwork of the elevator is put through a moisture-proof process and further precaution is taken by insulating the bus bars from the wood and iron work of the elevator.

IMPROVED VAUGHAN RAIL ANCHOR WRENCH

The wrench used for snapping into place the spring of the Vaughan rail anchor has recently been improved by closing the outer end of the slot, as shown in the accom-

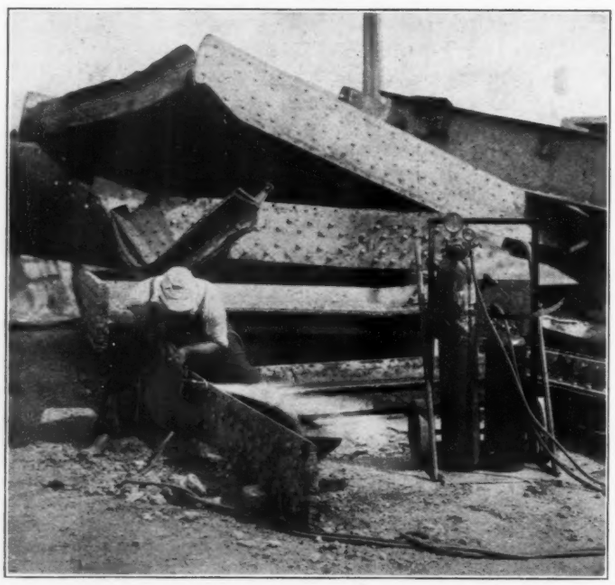
New Wrench for Use with Vaughan Rail Anchor.

panying illustration. It has been found that the old wrench with the open slot did not give the track men as good purchase on the spring as the new one with the closed slot does. It sometimes happened that the old wrench would pinch the end of the spring with the extreme

end of the jaws and would either wear out the nose of the wrench or spread the jaws. The use of the new wrench is advantageous since it compels the spring to be snapped securely into place. This rail anchor and wrench are manufactured by the Q. & C. Company, New York.

PREST-O-LITE GAS FOR OXY-ACETYLENE WELDING AND CUTTING

The use of the oxy-acetylene system for welding and cutting metals has become quite general. In many cases this system of cutting could be used advantageously if a convenient portable outfit was available for use in the field, as in the case of cutting up steel wreckage, old bridge material, etc. The Prest-O-Lite Company, Indianapolis, Ind., manufactures a welding outfit, using Prest-O-Lite cylinders as an acetylene supply, which is easily portable and simple in operation. The outfit includes also a cylinder of oxygen, regulators for the acetylene and the oxygen, a blow pipe equipped with various heads to permit various operations of welding and cutting and the necessary rubber tubing to connect the blow pipe to the regulating valves.



Prest-O-Lite Cutting Outfit in Service.

This outfit is also adapted to welding in shop work, as it is more simple and portable than an outfit using acetylene generators, and it is claimed that the cost is no greater. For certain classes of welding the additional advantage for the Prest-O-Lite system is claimed that a better weld can be secured with the clean, dry gas stored in the tank than is possible with the gas secured from a generator.

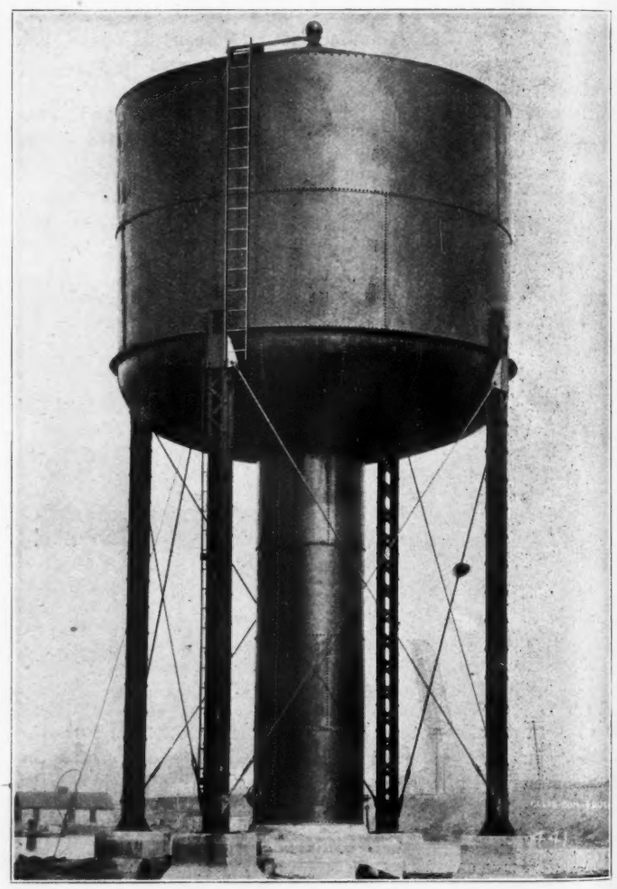
IMPROVED INTERIOR JOINT FOR SOLID MANGANESE CROSSINGS

An improved type of interior joint for solid manganese crossings has been developed by the Pennsylvania Steel Company, Steelton, Pa. The new joint is designed to increase the girder strength of the connections between the casting arms and make it possible to maintain the structure rigidly. The new joint consists of two full sections of open hearth rails into which the casting arm fits. The accompanying illustration shows this construction. The new joint has the added advantage of decreasing the tendency of the end of the crossing to slip. In casting, the metal may chill slightly at the ends of the wings and in running around the cores left for the joint holes, it may form layers. When the angle bar type of joint is tightened it tends to exert a spreading stress between the head and the flange of the casting and in some cases has actually split the arm. The improved joint tends to exert a compression stress between the top and the bottom of the casting, thus reducing the splitting tendency to a minimum. The Pennsylvania Steel Company now furnishes all of its solid crossings with this joint as it has been found that they add materially to the satisfaction of an installation.

New Interior Joint for Solid Manganese Crossings.

REVOLVING LADDER ON STEEL TANKS

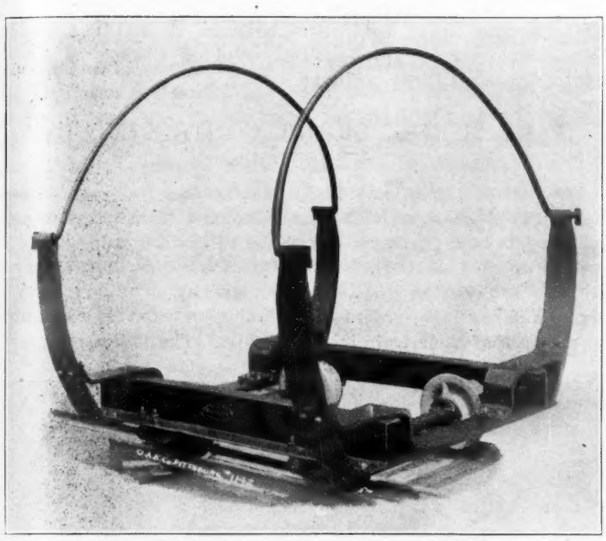
The Chicago Bridge and Iron Works, Chicago, has introduced a revolving ladder as an improvement to its all steel locomotive service tank. The accompanying photograph of a 50,000-gal. tank, built at Cleveland, Ohio, for the Pennsylvania Lines West, shows this new feature. The ladder is pivoted at the apex of the roof and is provided with rollers at the outside edge of the roof and also at the lower end of the ladder. By revolving the ladder around the tank every portion of the sides and roof becomes easily accessible for inspection and painting.



Steel Tank Showing Application of Revolving Ladder.

AN IMPROVED TRAM FOR A CREOSOTING PLANT

The Charlotte Harbor & Northern has installed at its creosoting plant at Boca Grande, Fla., an improved type of tie tram furnished by the Orenstein, Arthur, Koppel Co., Koppel, Pa. The car, which is shown in the accompanying illustration, has been designed with special attention to utilizing all the space possible, and with that in view the end sills are dropped down so that several ties can be loaded in between the side sills. The framework of the car is made of heavy bars in preference to structural sections, as it has been found that they resist corrosion caused by the creosote solution better than the



Improved Tie Tram.

structural shapes. The bars which hold the ties on the car are provided with pivoted pins at their ends, which when turned parallel with the bars, allow them to be pulled out without difficulty, and when turned perpendicular to the bars prevent their removal.

A NEW AUTOMATIC WRENCH

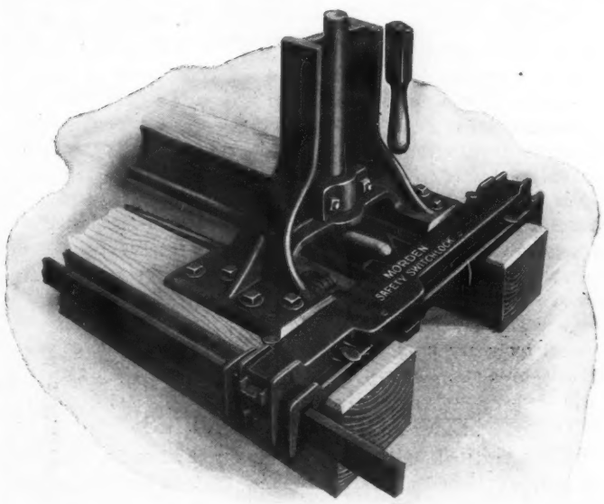
The "speednut" wrench shown in the accompanying illustration consists of a rack and pinion formed integrally with the movable jaw and the handle, respectively, so that the act of pulling on the handle tightens the wrench automatically on the nut. The greater the pull the tighter the grip on the nut, thus preventing slipping off and rounding

A New Automatic Wrench.

the corners of the nut. By reversing the pull the jaws are opened, allowing a ratchet adjustment to be made without removing the wrench from the nut. To loosen the nut it is only necessary to turn the wrench over. It is made of drop forgings and consists of only three pieces connected by a heavy pin. The size which is now being marketed by the Cochran Pipe Wrench Manufacturing Company, Chicago, has a range from ¼-in. to ¾-in. nuts. Two additional sizes, one smaller and one larger, will be made in the near future.

A NEW FACING POINT LOCK FOR SPLIT SWITCHES

A simple device for protecting facing point main line switches has just been developed by the Worden Frog & Crossing Works, Chicago, which can be spiked to the ties close to the ordinary circle throw main line stand, and which provides a positive bolt lock through an independent



New Facing Point Switch Lock.

lock rod. The lock rod is adjustable and the lock can be maintained with an efficiency of ⅛ in. The stand could be knocked down or broken without destroying the locking feature.

The device consists of a sliding lock bar registering through a notch in the independent lock rod and operated by the final movement of the crank of the switch stand, advantage being taken of the fact that with a switch stand crank which throws at right angles with the track the final inch of throw has practically no effect on the movement of the switch point.

THE TURNERIZED ROOFING SYSTEM

The roofing system of the Turnerized Roofing Company, New Orleans, La., is being used in a number of instances for recovering old roofs where the metal or other roofing material has disintegrated. The Turnerized cement has shown very satisfactory results in making a watertight and fireproof roof, as it is said to withstand the effect of atmospheric changes, acid, salt air and mechanical wear. Among the railway structures covered with this system are the Illinois Central train shed at Twelfth street, Chicago. This roof was applied in October, 1912, over an old metal roof. A freight shed 640 ft. long and 60 ft. wide was also roofed for the Illinois Central in Chicago in October, 1913. This application was made over slate. In the Union Stockyards, Pittsburgh, Pa., which is a Pennsylvania railroad property, 27 acres of roof have been covered with the Turnerized product, a part of which has been in use eight years without leakage. A freight shed at Albany, Ga., and a passenger station at Columbus, Ga., were roofed in 1911 for the Georgia Central. The new roofs were laid over standing seam metal, and up to date have given good satisfaction.

The base of this cement is iron ore, slate, graphite and vitrified cinder. The substances are caused to congeal under a special formula with a rubber asphaltum body, forming a liquid metallic substance which is applied with a bristle brush. One or two thicknesses of muslin are used with three coats of this cement. It requires 2½ gal. of cement

for 100 sq. ft. of surface, and the same area can be covered by 12 yds. of muslin, the cement costing $0.80 a gal. and the muslin about $0.07 per yd.

In covering a corrugated metal roof, the muslin sheets are divided into two strips 18 in. wide and after the metal has received a heavy coat of the cement, these strips are applied from the top toward the bottom, following up and down the corrugations, fitting the muslin into the indentations and at the end of the metal laps, so that the muslin fits closely to the metal surface. The muslin is soaked in water about 24 hours before using and is applied wet. A second coat of the cement is applied immediately and a second sheet of the 18-in. muslin is then laid in the same way with a lap of 1½ in. on the first strip. This coat is allowed to dry thoroughly from 17 to 20 days, after which a third or finishing coat of the cement is applied.

For covering other types of roofs, the full 36-in. width of the muslin is used, as there is no diffifulty in making it fit closely to the roof except in the case of the corrugated metal. In working over an old gravel roof steel tools are used to remove the gravel to secure a clean surface as a base for the cement and muslin coating. In covering shingles or slate, special tools are used to fit the muslin into the laps of each shingle or slate.

NEW SIGNALING DEVICES

The Union Switch & Signal Company, Swissvale, Pa., has recently developed a number of new devices for use in signaling.

By equipping a standard switch indicator with a push-button that keeps the indicator normally de-energized, a considerable saving in energy is effected. When it is desired to use the switch, the trainman pushes the button, and if it is safe to proceed the indicator will pick up and remain picked up by reason of the stick relay wiring until the train has entered the block, when it will be de-energized. All contacts necessary to accomplish this result are carried by the armature of the indicator itself.

The standard switch indicator has also been combined with the Union clockwork time release, the two devices being so connected electrically that the switch indicator is normally de-energized. After turning the handle of the screw release, contacts are made so that when the release has run down, if there is no train approaching, the indicator will clear. In this way a time interval is established, which can be ultilized to obviate the necessity for long preliminary sections.

Brass eyelets are now being furnished by this company so formed that by wrapping wire about them properly and pressing them in a pair of special pliers they will enclose the end of the wire, forming a loop which is permanent and free from electrolytic troubles. The brass eyelets are very similar to those used in shoes. The pliers have smooth, polished jaws and parallel motion.

Several electrically locked circuit controllers of the type made for a number of years have been interlocked by mounting side by side on a common base, which serves as a guide for mechanical locking bars of the Saxby & Farmer type. These bars are driven by pinions actuated by the shafts of the circuit controllers. This is a very convenient method of handling power-operated signals and other electrical devices where a standard interlocking machine would be unnecessary, but where some particular kind of check against false operation is needed.

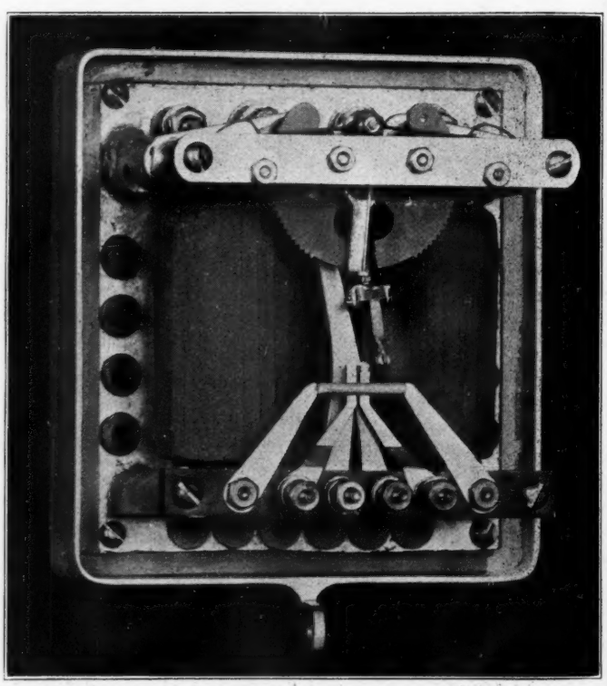
The Model 13 enclosed switch movement is 22 in. by 42 in. in outside dimensions. The apparatus has been arranged for maximum accessibility, strength and neatness. The motor drives a train of gears, which in turn actuate a slide bar, and this slide bar moves the switch throw rod through an alligator jaw. Circuit controllers for controlling the motor circuit itself and for external circuits, together with the type "F" switch controller, are all in the box. Each individual piece of apparatus inside the casting has its own cover and a sheet-iron container. All shafts, gears and pinions are horizontally mounted.

The Type "F" electric interlocking machine has recently been modified in several particulars. The modification consists chiefly in the arrangement of the quick-acting switches, push-buttons for the control of calling-on arms and other apparatus, the construction of the terminal board and the arrangement of indicator lamps. This machine is used with the Type "F" electric interlocking system, the distinguishing features of which are distinct and independent circuits for the control and indication.

A miniature train order table lever stand has been developed in which two levers are mounted and are arranged to accommodate circuit controllers beneath, so that two arms of a power-operated three-position train-order signal may be controlled in all three positions.

"TAKE SIDING" SIGNAL CONTROLLED BY SELECTOR

The selector manufactured by the General Railway Signal Company, Rochester, N. Y., for telephone train dispatching service has been successfully utilized to control "take siding" signals located at the outlying switches of passing tracks. By this system the dispatcher can display a "take siding" signal and can issue orders to the trainmen when they call up to report that their train is in the clear. The indication may



Selector Used for Operating "Take-Siding" Signal.

be given by a special semaphore, a disc, a light, or any prescribed aspect of the existing signals.

The signal is controlled by a key in the dispatcher's office, the two line wires of the selector and telephone circuit and a selector mounted near the "take siding" signal. A local battery supplies energy to operate the signal mechanism. The operation of the signal from the normal to the reverse position or from the reverse to the normal position produces a a special answer back indication informing the dispatcher that the signal has operated and that the proper indication is displayed. The usual station train order sig-

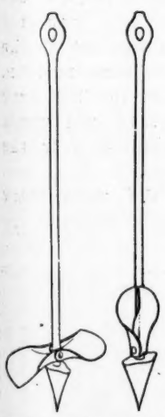
nals may be arranged in the same manner to indicate, for example, "stop, call up dispatcher for instructions." The only equipment required for installing such a signal is a key in the dispatcher's key cabinet, a selector and answer back device, a relay with its housing, an operating battery, and the signal mechanism.

A SUPERIOR RAIL JOINT INSULATION

While vulcanized fibre is recognized as a satisfactory material for insulated joints under normal conditions, in some cases where the fibre is submerged or subjected to extremely wet conditions at certain seasons, it is soon softened, so that it is destroyed by the passing of trains. To meet such severe traffic conditions the Continental Fibre Company, Newark, Del., has recently placed upon the market a new material for this purpose called Bakelite insulation. Bakelite has been under test for a number of years, and has shown very satisfactory results. It is said that it is not affected by the conditions mentioned above, which greatly reduce the life of fibre, and that severe tests have shown that in bad locations it will outlast more than 20 sets of fibre insulation. Although it is a much more expensive material than vulcanized fibre, its use in certain locations may be economical, particularly in view of the fact that the renewal of the insulating material in the joint is more expensive than the material itself.

A NEW TYPE OF GROUND ANCHOR

A new type of anchor for guy wires has recently been introduced in the railway field, although its advantages have been recognized for some time in the telephone and telegraph fields. This device, known as the "drive and twist" anchor, is an all-steel product made in three sizes varying in length from 5 to 6 ft. and having a diameter of blade from 8 to 12 in. It is installed by driving into the ground with a sledge to the required depth and then inserting a bar in the eye at the top of the rod and twisting three revolutions to the right. The blades are so constructed that while the anchor is being driven they are folded against the rod, but their peculiar shape causes them to open when the rod is twisted. As the anchor enters the ground in a collapsed form it does not disturb the soil, thus making it possible to secure a firmer anchor than is possible with one of the types that requires the digging of a hole. In addition to this advantage, the anchor is said to be cheaper than the types usually used. The "drive and twist" anchor is manufactured by the Gund Manufacturing Company, La Crosse, Wis.



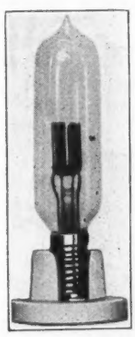
The "Drive and Twist" Ground Anchor.

A NEW GROUND ANCHOR

The Bell Telephone Company, in Canada, has adopted the new ground anchor manufactured by the B. J. Coghlin Company, Montreal, Que., after extensive tests. The anchor consists of a swiveling eyelet, to which the guy wire is attached, a rod fitting in this eyelet, and an anchor plate attached to the bottom of the rod by a pin inserted in a slot in the rod, so that the plate is movable about the end of the rod. During the driving of the anchor the plate rests against the side of the rod and is locked firmly in this position by the point of the rod resting against the side of the plate. The lower end of the plate is pointed, allowing it to be driven easily. When the anchor has reached the desired depth a pull is exerted on the rod, and, as the prongs on the upper end of the plate prevent it from pulling up, it is turned across the end of the rod, forming a secure anchor. The plate is ribbed lengthwise and crosswise to secure maximum strength for the sides, and the rod and connecting pin are tested with a load 50 per cent greater than the plate will hold. The special advantage of this anchor lies in the fact that it can be placed in position in a very short time without digging a hole or using any special tools.

NEW TYPE OF "VAC-M" ARRESTER

The fundamental principles of the "Vac-M" lightning arrester have recently been applied in several new types. These arresters take advantage of the fact that the resistance to static and high tension electricity in a vacuum is very low, allowing a much wider gap to be maintained between the electrodes than is possible in air, thus securing the same protection while eliminating most of the danger of grounding. For a condition requiring a gap as small as 1-1000 in. in air, a gap of ⅛ in. can be used in vacuum.



"Runt" Type Lightning Arrester.

One of the new types is known as the "Runt" grounded circuit telephone type, which is designed for general telephone protection against lightning and static. It is not suited for use on 110 or 220-volt power circuits unless installed behind a small capacity fuse. This arrester consists of a small cylindrical globe with two carbon electrodes, one for the line and one for the ground connection, supported by insulating cement on a basis of glass stem sealed in to globe and containing suitable leading in wires and platinum. The wires are soldered to a brass base. A standard miniature Edison porcelain receptacle is used. The entire arrester is 3½ in. high and the receptacle is 1½ in. in circumference. These arresters are furnished with a ⅛-in. gap between the electrodes unless specified to the contrary. These arresters are manufactured by the National Electric Specialty Company, Toledo, Ohio.

SERVICE TEST OF OKONITE INSULATION

Three cables of four conductors each, laid in 1900, and three cables of four conductors each, laid in 1904, on the lines of the Commercial Cable Company, between New York City and Coney Island by the Okonite Company have just been removed and have been found to be in such good condition that they are being relaid on new lines of the same company with the expectation that they will give many more years of service.

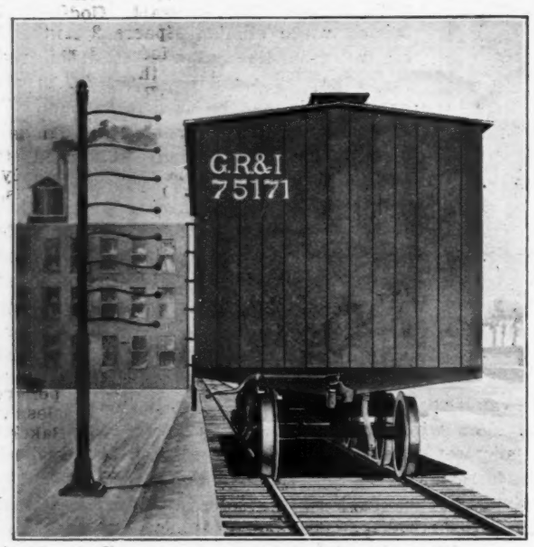
These cables formed a part of the connection from the main office of the company in New York City to a point on the sea shore at the eastern end of Coney Island where the Trans-Atlantic and other deep sea cables terminate. The United States government recently decided to dredge a channel into Jamaica Bay crossing the line of cables, making it necessary to remove them, which was done by transferring the landing place of the ocean cables from Coney Island to Far Rockaway, which is well outside of the zone of dredging operations. This change necessitated the laying of an underground connection from the main office in New York City to Far Rockaway, a distance of 22 miles. The three 14-conductor lead-covered cables for this line have been laid in an underground conduit by the Okonite Company and the installation has been accepted. After this connection was completed the cables over the Coney Island route were taken up and

are now being laid as extra conductors on the Far Rockaway line. Tests on completed sections show the installation to be practically unimpaired after a maximum service of 14 years.

SIDE CLEARANCE TELLTALE

In order to prevent injury to persons on moving trains from too close side clearances, a side clearance telltale has been put on the market by Selbert M. Connor, Chicago. The application of this warning is much the same as that for bridges, except that the position is vertical and at the side of the track instead of horizontal and overhead.

A steel pole 13 ft. 6 in. high above the foundation is mounted on a standard cast iron base similar to those used for relay and cable posts. The pole would usually be placed about 9 ft. from the center of the tracks. A number of flexible rubber-covered and cork-tipped fingers



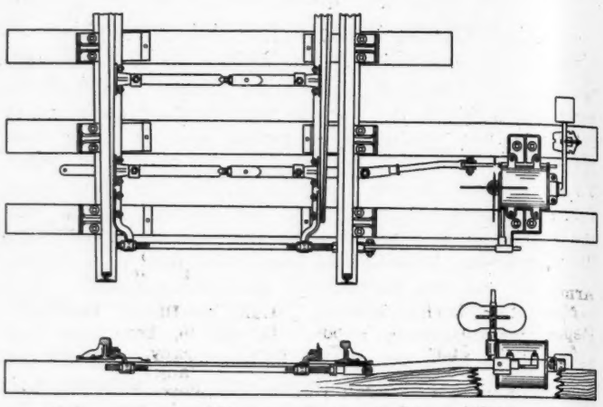
A Side Clearance Tell-Tale.

2 ft. 6 in. long extend out horizontally towards the track from the pole. These fingers will immediately resume their horizontal position when bent out of place. The complete device weighs approximately 175 lbs., boxed.

A SINGLE LEVER FACING POINT LOCK SWITCH STAND

A new facing point switch stand which is designed to bolt lock the switch point in the main line position was placed in service in a high-speed main line on a large eastern road in October, 1912, by the Weir Frog Company, Cincinnati, Ohio. The stand has been in continuous service since that time and it has been proven that an obstruction of ⅛ in. between the switch point and the stock rail will prevent the lock plunger from entering the hole in the locking bar which is necessary before a safety signal can be given. These stands are now being furnished to other prominent roads for trial.

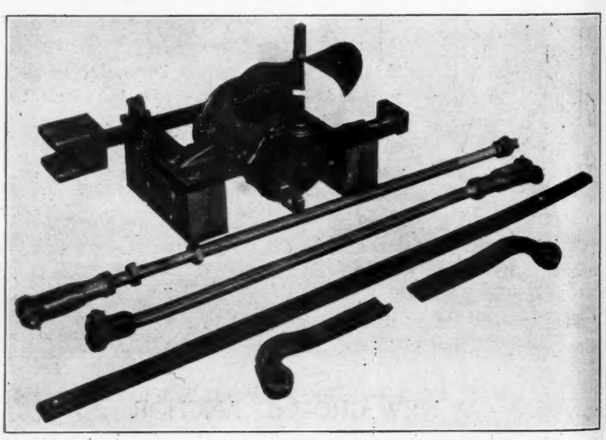
The single lever of the stand is arranged to throw the switch point, bolt-lock it in position in the main line, and move the target to the position corresponding to that of the switch point. These operations are accomplished by the use of a horizontal rotating barrel of cast steel with a spiral slot and a vertical cam, the slot affecting the movement of the point and the cam operating the facing point lock plunger, which in turn operates a rack turning the target and lamp. When the switch points are in position for main line movement the target shows safety and the plunger is in position in the hole in the locking bar. To throw the points to the sidetrack position the lever is raised, the first 55 degrees of its revolution effecting the withdrawal of the plunger pin from the locking



New Facing Point Lock Switch Stand.

bar and simultaneously the turning of the target from safety to danger. This movement of the lever has no effect on the position of the switch points, which insures that a danger signal will be given immediately upon the withdrawal of the plunger rod from the locking bar. As the lever is thrown beyond the 55 degree position the spiral slot engages a roller on the throw bar connected to the switch head rod. The continued movement of the lever forces the switch point into the sidetrack position. No attempt is made to lock the points in the sidetrack as this is a temporary position of the switch and would only be used while a train is being operated over the turnout.

When the switch is moved back to the main track position, the first movement of the lever returns the



Single Lever Facing Point Lock Switch Stand.

switch points from the sidetrack to the main track and the latter part of the revolution throws the plunger lock in the locking bar and sets the target at safety. The locking bar, which extends through a guide in the body of the stand, is attached by a connecting rod to lugs at the ends of the switch points. The stand can be arranged to operate mechanically a semaphore ahead of the switch, or it can be used in connection with electric block signals by the use of an electric switch lock.

List of Exhibitors at the Coliseum and Armory

Companies, Space Numbers, Devices Exhibited and the Names of Representatives—How to Locate Each Exhibit

The following is a complete list of all exhibits, in place or being installed, in the Coliseum and the First Regiment Armory. Spaces numbered from 1 to 324 inclusive, are in the Coliseum, and, unless otherwise indicated, the space numbers in the list are in the Coliseum. Exhibits in the Armory are so indicated:

Adams & Westlake Company, Chicago, Ill.—Signal lamps, train indicator lamps, switch locks, long time burners, lanterns, etc. Represented by W. H. Baldwin, G. L. Walters, A. S. Anderson, C. B. Carson, W. J. Piersen, H. G. Turney and T. A. Galt. Spaces 83, 84, 102 and 103.

Ajax Forge Company, Chicago, Ill.—Manganese steel one-piece guard rail, guard rail clamps, adjustable switch rods and Ajax rail steel braces. Represented by F. B. Bradley, H. C. Elfborg and H. C. Hutchins. Spaces 230-235, Armory.

Ajax Rail Anchor Company, Chicago, Ill.—Anti-creepers. Represented by H. G. Elfborg. Space 236, Armory.

American Guard Rail Fastener Company, Philadelphia, Pa.—Vaughan automatic rail anchors, Vaughan guard rail clamps, anchor guard rail clamps, tie plate guard rail fasteners. Represented by D. F. Vaughan and L. T. Burwell. Space 119.

American Hoist & Derrick Company, St. Paul, Minn.—"American" railroad ditcher. Represented by W. O. Washburn, F. J. Johnson, J. L. Hickey, W. L. Manson, C. C. Austin, Harold Washburn and R. V. Ford. Space 47.

American Rail Joint Company, Toronto, Canada.—Reinforced angle bars and rail joints. Represented by Thos. D. Beddoe and J. J. Gartshore. Space 180.

American Rolling Mill Company, The, Middletown, O.—Corrugated metal culverts, roofing and sheet metal products. Represented by F. B. Milhoan and G. L. Sheets. Spaces 99 and 100.

American Steel & Wire Company, Chicago, Ill.—Right-of-way fencing, galvanized steel fence posts, steel farm crossing gates, signal wire, switch ropes, telegraph and telephone wires, insulated wires and cables. Represented by B. H. Ryder, L. P. Shanahan, A. W. Sprague, F. J. Conkling and C. S. Knight, Jr. Spaces 261, 262, 267, 268, Armory.

American Valve & Meter Company, Cincinnati, Ohio.—Poage automatic water columns and tank fixtures, Fenner drop spout, Anderson economy switch stands, interlocking switch stands, safety switch locks. Represented by J. T. McGarry and F. C. Anderson. Spaces 130, 131 and 132.

American Vulcanized Fibre Company, Wilmington, Del.—Original vulcanized fibre for rail joint insulation, steel tie insulation and for electrical and mechanical uses. Represented by G. K. Parsons, W. A. Jordan, C. C. Bell and John Barron. Space 125.

Art Metal Construction Company, Jamestown, N. Y.—Steel office equipment; steel files, desk and lockers; verticle steel plan files. Represented by C. B. Ulrich and H. W. Lombard. Space 190.

Asphalt Ready Roofing Company, New York, N. Y.—Asphalt prepared roofing and asphalt shingles, asphalt felts. Represented by B. Blackwell, H. H. Huested and W. A. Hemenway. Space 168.

Atlas Preservative Company of America, Inc., New York, N. Y.—Descriptive matter on Atlas products, particularly Atlas "A" weed killer and track preservative. Represented by R. N. Chipman and Jacob Kramer. Space 169.

Barco Brass & Joint Company, Chicago, Ill.—Barco flexible joints for water works connections and intakes, Barco flexible joints for suction dredges, Barco flexible joints for steam shovels, Barco roundhouse blower sets, Barco roundhouse blow-off sets. Represented by F. N. Bard and L. W. Millar. Space 4.

Barrett Manufacturing Company, New York, N. Y.—Roofing (Barrett specification roofs), "Tar-Rok" sub-floor construction, bridge waterproofing, waterproofing and dampproofing for masonry. Represented by H. B. Nichols, W. S. Babcock, Henry Olmsted, Jr., B. B. Brewer, E. J. Caldwell and J. J. Ross. Space 107.

Bausch & Lomb Optical Company, Rochester, N. Y.—Engineers' and surveyors' instruments, Balopticons (projection lanterns). Represented by Dunbar D. Scott, Charles A. Bengston, Burton H. Witherspoon. Space 86.

Blessing, Louis, Jackson, Mich.—Reinforced concrete tie, rail clamp and noiseless rail joint. Represented by C. H. Hand. Space 159.

Bowser, S. F., & Co., Inc., Fort Wayne, Ind.—Oil storage systems, self-measuring long distance and power driven pumps, oil storage tanks, gasolene storage, self-registering pipe line measures, oil filtering and circulating systems. Represented by J. L. Handy, W. T. Simpson and W. E. Jenkinson. Space 12.

L. S. Brach Supply Company, New York, N. Y.—Lightning arresters, insulating compounds, railway crossing signals, Brach hydro-grounds, Brach vacuum arrester testing sets, Brach lightning arrester cabinets, Brach iron arrester cases, Brach volt meters, solderall and solderall torches and Brach duplex shunts, rail contacts, recording devices, Brach arrester pole boxes, Brach improved tags, Brach improved terminal blocks, switch rods, adjustable resistance units. Represented by L. S. Brach, Godfrey Gort, A. G. Brach and George Cartwright. Spaces 2 and 17.

Brown Rail Loader, Boston, Mass.—Model of rail loader. Moving picture and stereopticon views of the loader in operation. Represented by James C. Barr and Robert H. Anthony. Space 275, Armory.

Bryant Zinc Company, Chicago, Ill.—Crossing signals, relays, channel pins, annunciators, Waterbury batteries, and Orangeburg fibre conduit. Represented by Stanley C. Bryant, J. P. Costigan, W. P. Graves, J. W. Cremerius, A. F. Klink and H. F. Worden. Spaces 154 and 155.

Buda Company, The, Chicago, Ill.—Motor cars, track drills, bumping posts, jacks, switch stands, car replacers, electric storage battery shop truck, electric crossing gate, automobile engines, electric locomotive headlights, etc. Represented by H. C. Beebe, C. H. Bull, W. C. Dyer, H. S. Evans, R. B. Fisher, J. J. Gard, L. Hamill, Wm. P. Hunt, Jr., E. Johnson, G. J. Slibeck, M. E. Towner, T. H. Wheeler. Spaces 87, 88, 89 and 90.

Cambria Steel Company, Johnstown, Pa.—100 per cent. rail joints, Morrison guard rails, tie plates, rails, axles, wire fence. Represented by J. L. Replogle, M. G. Baker, A. Morrison, C. J. Ellis, E. H. Bankard and E. F. Kenney. Spaces 263 and 266, Armory.

Philip Carey Company, Cincinnati, O.—Carey flexible cement roofing, waterproofing materials, ceil board, pipe covering, etc. Represented by C. L. Cockrell, P. A. Johnston, F. R. Schueler and J. E. Fitzpatrick. Space 157.

Carnegie Steel Company, Pittsburgh, Pa.—M-20 steel cross ties, illustrating track installed on Pennsylvania Railroad; United States steel sheet piling, steel wheels, rolled steel locomotive piston head, Duquesne rail joints, hot and cold worked splice bars, Braddock insulated rail joint, automatic stereopticon, showing views of steel tie track and steel piling installation. Represented by N. M. Hench, L. C. Lustenberger, Robert Coe, C. F. W. Rys, John McLeod, C. E. Dinkey, J. W. Dix, H. D. Williams, H. W. Summers, Edwin S. Mills, C. B. Friday, G. W. Landrus, H. van Zandt, G. E. Dix. Spaces 257, 258, 259, 260, 269, 270, 271 and 272, Armory.

George B. Carpenter & Company, Chicago, Ill.—Railway supplies. Represented by H. W. d'Evers, H. S. Hanson, W. R. Sostheim, A. O. Slaughter, M. Kaplan and F. A. McLauchlan. Spaces 113 and 114.

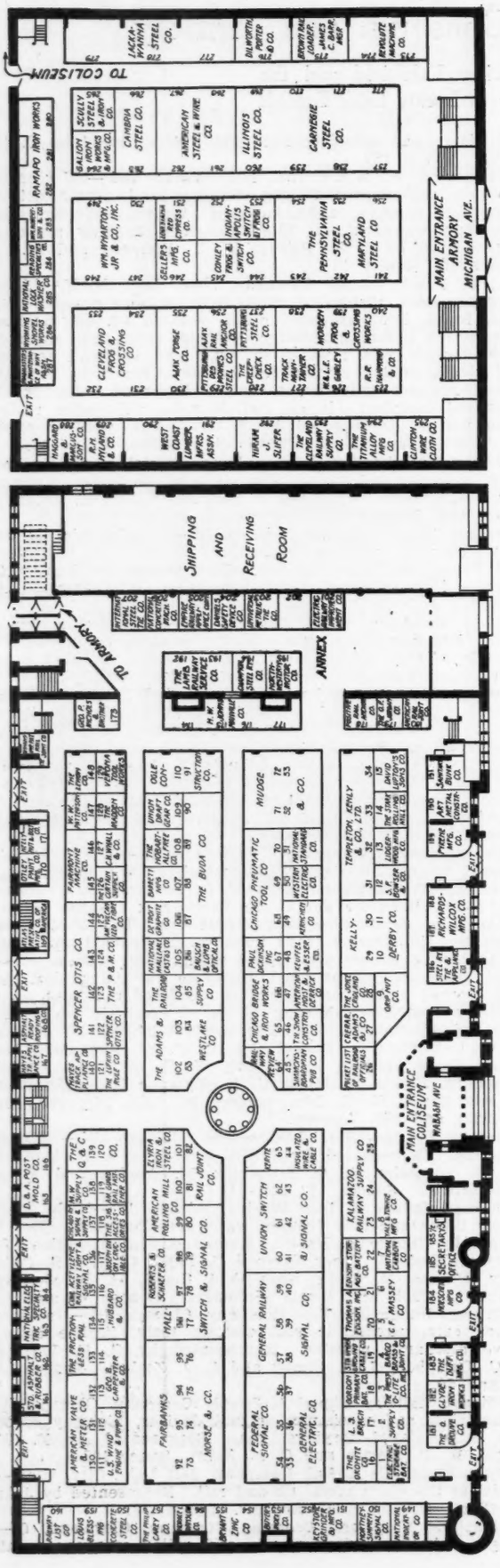
Chicago Bridge & Iron Works, Chicago, Ill.—Model steel water tanks and new by-pass water treating plant. Represented by George T. Horton, Horace B. Horton, Robert H. Murray, Merle J. Trees, Elwood G. Ladd, Charles S. Pillsbury, Clinton M. Ladd, Kenneth I. Small, H. B. Murphy, Frank L. Cook and Lewis McDonald. Spaces 65 and 66.

Chicago Pneumatic Tool Company, Chicago, Ill.—Rockford motor cars, pneumatic and electric tools, Zerbee safety valve discharge register. Represented by C. E. Walker, J. C. Campbell, J. L. Canby and L. J. Zerbee. Spaces 68, 69 and 70.

Chicago Railway Signal & Supply Company, Chicago, Ill.—Electrical and mechanical signal devices, highway crossing bells, signal forgings, etc. Represented by E. W. Vogel, W. C. Martin and C. N. Suhr. Space 137.

Clark Metal Tie & Rail Company, Salt Lake City, Utah.—Model of the Clark metal tie and rail. Represented by John W. Clark, Jr., and H. H. Keysaw. Space 194.

Cleveland Frog and Crossing Company, Cleveland, O.—Frogs, switches, switch stands and rolled manganese rail



Floor Plan of Coliseum and Armory, Showing Arrangement of Exhibits.

crossings. Represented by George Stanton, L. G. Parker, W. S. Moore, George Arnold, Jr., and G. A. Peabody. Spaces 231, 232, 233 and 234.

Cleveland Railway Supply Company, Cleveland, Ohio.—Clary tie plates, "Safety" foot guards, Odenkirk switch stands, "Economy" separable switch points, malleable iron rail braces and slide plates, Newhall guard rails, Newhall guard rail fasteners, Newhall screw spikes and tie plates. Represented by W. S. Newhall and S. W. Linn. Space 293, Armory.

Clinton Wire Cloth Company, Clinton, Mass.— Electrically welded wire for use in reinforced concrete and steel work protection; miscellaneous wire products. Represented by J. M. Gibson and J. W. Stromberg. Space 295, Armory.

Clyde Iron Works, Duluth, Minn.—Double cylinder, double drum, 12 h.p. hoist equipped with friction clutch, material elevator sheave, working model Field tower excavator, various sizes of blocks and sheaves. Represented by A. E. Holcomb and G. P. Miller. Space 182.

Commercial Acetylene Railway Light & Signal Company, New York, N. Y.—Flashing signals, commercial acetylene headlights, acetylene signal lighting, A. G. A.-Dalen signal devices, oxy-acetylene welding. Represented by H. G. Doran, C. E. Lee and E. T. Sawyer. Spaces 135 and 136.

Concrete Steel Company, Chicago, Ill.—Reinforcing bars, concrete specialties and safety tread. Represented by Fred C. Harper and John G. Ralston. Space 158.

Conley Frog & Switch Company, Memphis, Tenn.—Four designs of Conley frogs. Represented by J. E. Conley, F. W. Lange and J. W. Buzick. Spaces 244 and 245 Armory.

Creepcheck Company, Inc., The, New York, N. Y.—Dinklage Creepcheck anticreepers. Represented by John R. C. Long and W. E. Marvel. Space 228, Armory.

Crerar, Adams & Co., Chicago, Ill.—Calumet heavy duty track drills, Eureka bonding drills, Hercules steel trucks, Young die starters, Vanadium track shovels. Represented by Russell Wallace, W. I. Clock, J. A. Martin, G. D. Bassett, T. W. Barrett and C. J. O. Swift. Space 27.

Curtain Supply Company, The, Chicago, Ill.—Ring curtain fixtures, Rex all metal curtain rollers, Rex sash balances, Rex vestibule curtain outfit including: Rex opening shield, Rex release handle, Rex steel roller, Rex No. 6 hook, CSCO and Rex U-shape diaphragms. Represented by W. H. Forsyth, F. M. Egolf and R. S. Reynolds. Space 126.

D. & A. Post Mold Company, Three Rivers, Mich.—"D & A" post machines; anchor and brace molds; post reinforcements and tie wires; concrete fence posts. Represented by G. H. Dougherty and L. W. Dougherty. Spaces 165 and 166.

Daniels Safety Device Company, Chicago.—Bulldog locknut. Represented by T. M. Daniels, John Hill, Jr., J. C. Holschemacher, B. E. Dettman and S. A. Armstrong. Space 204.

Detroit Graphite Company, Detroit Mich.—Paints for railroad service. Represented by T. R. Wyles, L. D. Mitchell, A. H. Kuerst, W. G. Bradford, R. O. F. Randolph and J. J. Hogan. Space 106.

Paul Dickinson, Inc., Chicago, Ill.—Smoke jacks, ventilators, chimneys and cast iron telephone booths and outhouses. Represented by A. J. Filkins, J. A. Meaden, Wm. H. Dayton, Geo. M. Kenyon and F. C. Webb. Space 67.

Dilworth, Porter & Co., Ltd., Pittsburgh, Pa.—Railroad spikes and tie plates. Represented by W. F. Schleiter, Charles Johnston and Jos. Dilworth. Space 276. Armory.

Joseph Dixon Crucible Company, Jersey City, N. J.—Dixon's silica-graphite paint and graphite productions. Represented by H. W. Chase, R. R. Belleville and F. B. Gibbs, Jr. Space 117.

G. Drouve Company, The, Bridgeport, Conn.—Skylights, sash operators and McKay concrete forms. Represented by Wm. V. Dee, R. S. Adam and S. R. McKay. Space 181.

Duff Manufacturing Company, Pittsburgh, Pa.—Barrett lever jacks, Barrett geared ratchet jacks, Duff ball bearing screw jacks, Duff high-speed ball bearing jacks, Duff-Bethlehem forged steel hydraulic jacks. Represented by T. A. McGinley, E. A. Johnson, C. N. Thulin and G. A. Edgin. Space 182.

Thomas A. Edison, Inc., Orange, N. J.—Primary batteries for signal operation and track circuits; working model arranged to show operation of Edison B. S. C. O. cells on track circuit under all conditions. Represented by E. E. Hudson, F. J. Lepreau, E. W. Brown, P. A. Garrity, P. B. Hyde and Edward McGall. Spaces 20, 21 and 22.

Edison Storage Battery Company, Orange, N. J.—Storage batteries for railway signals, car lighting, telegraph and telephones. Represented by H. G. Thompson, W. W. Coleman, W. F. Bauer and G. W. Daves. Space 22.

Electric Railway Improvement Company, The, Cleveland, Ohio.—Rail bonds. Represented by Gerald Howatt and L. J. Rinker. Space 201.

Electric Storage Battery Company, Philadelphia, Pa.—"Chloride," "Tudor," "Exide," "Hycap" and "Ironclad-Exide" batteries to be used in car lighting, telephone, telegraph and signal operation; storage battery locomotives, central station batteries, commercial industrial trucks and operation of drawbridges. Special apparatus illustrating the operation of railway signals by storage batteries. Represented by G. H. Atkin, T. Milton, H. N. Beck, R. J. Baird, T. A. Cressey and P. G. Downton. Space 1.

Elyria Iron & Steel Company, The, Elyria, Ohio.—Tie plates and rail joints. Represented by Guilford S. Wood, A. W. DeRocher, W. T. Bentz and B. M. Barr. Space 101.

Empire Railway Appliance Corporation, New York, N. Y.—Rail-anchor, tie plate (combined). Represented by S. D. Barnett and E. B. Powers. Space 205.

Fairbanks, Morse & Co., Chicago, Ill.—Kerosene and gasoline motor cars, Wico ignitor exhibit, 15 h.p. fuel oil engine driving 7½ k. w. generator for lights and power; 2½ h.p. electric motor driving a centrifugal pump, high duty centrifugal pump, steam pump, power pump, double acting deep well cylinder, railway water column, chain hoists, springless dial scales, coaling stations. Represented by C. W. Pank, A. A. Taylor, E. M. Fisher, F. N. Whitesell, G. J. Akers, L. H. Matthews, F. M. Condit, D. J. Higgins, J. L. Jones, C. T. Fugitt, F. H. Douglas, K. P. Brown, W. W. Adams, A. M. Fenwick, D. K. Lee, L. Norvell, F. V. Roy, C. H. Wilson, E. E. Pendray, H. E. Vergosen, J. G. Jones, W. F. Singer, E. C. Golladay, U C. Kalar and J. T. Gratiot. Spaces 73, 74, 75, 76, 92, 93, 94 and 95.

Fairmont Machine Company, Fairmont, Minn.—Motor cars, engines, electric light engine, inspection car. Represented by F. E. Wade and H. E. Woolery. Spaces 145-146.

Federal Signal Company, Albany, N. Y.—Federal electric interlocking, Federal electromechanical interlocking machine, Federal switch guard, Federal top and bottom post signal mechanisms, Federal audible signal 3-position solenoid dwarf signal, mercury time release, hand time release, track model, battery charging switch, switch box, etc. Represented by A. H. Renshaw, J. T. Cade, C. Henze, H. G. Thompson, H. C. Ware, H. P. Ober, John Kelly and W. H. Reichard. Spaces 54, 55 and 56.

The Frictionless Rail, Boston, Mass.—Rail for track curves. Represented by F. A. Barbey, J. W. Manama, S. W. Simonds, G. H. Bryant, T. F. Dwyer, Jr. and W. E. Cade, Jr. Spaces 133 and 134.

Galion Iron Works and Manufacturing Company, Galion, Ohio.—Culvert pipe, Sterling metal corrugated culvert pipe, Ideal cast iron culvert pipe, Ideal cast iron perforated drain pipe. Represented by T. M. Derickson. Space 264 Armory.

General Electric Company, Schenectady, N. Y.—Electrical equipment for steam railroads and railway supplies. Represented by H. L. Monroe, A. W. Jones, W. O. Kellogg, W. H. Colman, J. Roberts, H. M. Jacobs, L. W. Shugg, A. P. Jenks, L. A. Crawford, C. H. Jones and B. F. Bilsland. Spaces 35, 36 and 37.

General Railway Signal Company, Rochester, N. Y.—Electric and mechanical interlocking, alternating and direct current automatic block signaling appliances, also train dispatchers' selector system; electric interlocking (dynamic indication)—two model 2 electric interlocking machines, 110 volt semi-automatic Model 2A signal, 110 volt Model 2A dwarf signal, Model 2 and Model 4 switch machines, relays and indicators; mechanical interlocking—Dwarf signal, "EZ" motion plate rail clips, adjustable deflecting bars, R. S. A. standard pipe carriers, cranks, compensators, solid and screw jaws, pipe lugs, pipe adjusting screws, jaw and crank pins. Model 2A power distant signal (dynamic indication), Model 2B electric lock, relays, indicators, circuit controllers; alternating current automatic block signaling—110 volt Model 2A signal with induction motor, light signal, Model 2 and Model 4 relays and indicators, impedance bonds, transformers and other appliances which are also used in direct current signaling; direct current automatic block signaling—10 volt Model 2A signal, Model 9 relays and indicators, three position motor relay, Model 5A switch circuit controller, Model 1B lightning arrester, relay boxes, cable posts, cast iron battery chute; train dispatchers' selector system—Selectors, bells, key cabinet, line relay, reactance and capacity units, take siding signal with its "answer back" device; outlying switch lock. Represented by M. R. Briney, P. E. Carter, E. P. Crane, S. M. Day, L. E. Dodge, F. L. Dodgson, W. S. Henry, W. K. Howe, F. H. Jones, W. W. Lavarack, R. C. Leake, H. W. Lucia, F. W. Moffett, A. G. Moore, C. O. Poor, F. W. Rizer, F. B. Rosencrans, W. W. Salmon, V. I. Smart, H. M. Sperry, L. B. Somerby, H. B. Taylor, L. Thomas, A. Thomson, S. N. Wight, W. P. Woodruff, M. Wuerpel and W. R. Young. Spaces 38, 39, 40, 57, 58 and 59.

Gordon Primary Battery Company, New York, N. Y.—Gordon primary RSA signal battery, Waterbury track circuit battery. Represented by O. S. Flath, G. A. Nelson and W. M. Kinch. Space 18.

Grip Nut Company, Chicago, Ill.—Grip nuts and grip holding nuts. Represented by W. E. Sharp, W. G. Willcoxson, Blake C. Hooper and E. V. Le Space 9.

W. & L. E. Gurley, Troy, N. Y.—Field instruments for civil, mining and hydraulic engineers and land surveyors, precision weights; railroad scale testing outfit; large office balance, "Wilder" railroad coach thermometers. Represented by H. McM. Dibert, J. C. Connors and H. N. Seay. Space 226, Armory.

Haggard & Marcusson Company, Chicago, Ill.—Tiger steel bunks. Represented by Henry H. Marcusson. Space 289, Armory.

Hall Switch & Signal Company, New York, N. Y.—Automatic signals, relays, switch boxes, electric interlocking machines, switch machine and auxiliary appliances used in signal work. Represented by W. H. Lane, W. J. Gillingham, H. J. Mullineaux, W. E. Harkness, E. J. Blake, H. L. Hollister, O. B. Frink, A. B. Kendall, E E. Backus, Roy Connell and H. W. Wolff. Spaces 77, 78, 79, 80 and 96.

R. R. Hammond & Co., Philadelphia, Pa.—O'Brien insulated switch rods for double slip crossings, single switches, etc. Represented by R. R. Hammond and Thomas O'Brien. Space 225.

Hayes Track Appliance Co., Richmond, Ind.—Hayes derails models A, C, CX, E, H, HP and HX with operating stands and target stands. Represented by S. W. Hayes, W. Harding Davis, E. L. Ruby, E. W. Brown, E. C. Knapp, Wellington B. Lee, Arthur Gemunder and F. C. Stowell. Spaces 140 and 167.

Hobart-Allfree Company, The, Chicago, Ill.—Smyth and Freeland cast steel derailers, Newton car replacers. Represented by B. F. Hobart, E. H. Allfree and W. H. England. Space 108.

Hoeschen Manufacturing Company, Omaha, Neb.—Mechanical highway crossing bells. Represented by H. P. Ryner, H. Hoeschen, H. Holdrege, A. H. Fetters, R. W. Wood, R. A. Fry and E. Ehrig. Space 184.

Hoskins & Company, Z. T., Chicago, Ill.—Built up rail. Represented by Z. T. Hoskins. Space 204.

Hubbard & Co., Pittsburgh, Pa.—railroad track tools, track shovels, locomotive scoops, Hunt nut lock. Represented by R. L. Mason, Geo. H. McCommon and O. W. Youngquist. Spaces 115 and 116.

R. H. Hyland & Co., Chicago, Ill.—Norton ball bearing jacks, Mulconroy flexible metallic hose, Williams clam shell buckets. Represented by R. H. Hyland, W. J. Lawrence and E. H. Burghart. Space 289, Armory.

Illinois Steel Company, Chicago, Ill.—Tie plates, base plates, screw spikes, standard spikes and bolts. Represented by O. H. Baker, F. R. Ohl and D. E. Sawyer. Spaces 257, 258, 259, 260, 269, 270, 271 and 272, Armory.

Indianapolis Switch & Frog Company, Springfield, O.—RNR solid manganese frog, "Indianapolis" manganese crossing, RNR frog crossing, "Indianapolis" portable electric welder, electric welded joints, track grinder. Represented by E. C. Price, J. A. Foulks, W. H. Thomas and J. C. Jameson. Spaces 252 and 253, Armory.

International Steel Tie Company, Cleveland, Ohio.—International twin steel ties for steam road construction, International twin steel ties for paved street construction, International joint tie construction showing method of bonding, steel substructure for crossings both steam and electric railways. Represented by William P. Day, P. H. Lavan, Lyman C. Shank, George Harpham and John J. O'Donnell. Space 207.

Johns-Manville Company, H. W., New York, N. Y.—Asbestos smoke jacks, shingles, roofings, passenger and freight car insulation, pipe coverings, boiler lagging, cork insulation, cork tile, waterproofing materials, mastic flooring, packings, sectional conduits, fibre conduits, electrical materials. Represented by J. E. Meek, J. C. Younglove, E. T. Wade, L. L. Cohen, Geo. Christenson, F. W. Doty, M. H. Farnsworth, C. D. Folsom, R. A. Hamaker, L. E. Hassman, W. J. Hennessey, F. J. Horne, P. C. Jacobs, D. L. Jennings, W. H. Lawrence, H. L. Leach, H. T. Morris, C. E. Murphy, H. G. Newman, G. A. Nicol,

H. B Sewell, J. H. Trent and H. A. Waldon. Spaces 174, 175, 176 and 177.

O. F. Jordan Company, Chicago, Ill.—Jordan spreader. Represented by Mark J. Woodhull and A. C. Stansill. Space 179.

Joyce-Cridland Company, Dayton, Ohio.—Railway supplies. Represented by Chas. D. Derby, Geo. W. Llewellyn and Frank I. Joyce. Space 28.

Kalamazoo Railway Supply Company, Kalamazoo, Mich.—General line of track and railway supplies, including motor cars, hand and velocipede cars, track drills, track jacks, track gauges, levels, etc. Represented by John McKinnon, W. D. Waugh, F. E. McAllister, D. A. Stewart, H. R. Miller, W. Winterle, W. N. Sidnam, H. N. Whipple and E. Hicks. Spaces 23, 24 and 25.

Kelly-Derby Company, Chicago, Ill.—Pumps, engines, motors, well cylinders and strainers, steam traps, wire cloth, crucibles, rail braces and rubber. Represented by C. M. Belding, H. L. Bachman, W. N. Weinman, C. W. Kelly, S. D. Baldwin, W. B. Holcomb, A. B. Cross, Glen W. Holcomb, W H. Day, Jno. D. Bird, Curtis Penberthy and C. Maits. Spaces 10, 11, 29 and 30.

Kerite Insulated Wire & Cable Company, New York, N. Y.—Kerite insulated wires and cables. Represented by R. D. Brixey, Azel Ames, P. W. Miller, J. W. Young, Joseph A. Renton, B. L. Winchell, Jr., and G. A. Graber. Spaces 63 and 44.

Kernchen Company, Chicago, Ill.—Model of a round house equipment with Kernchen ventilators; standard galvanized ventilators; street railway car ventilators; asbestos protected ventilator. Represented by W. K. Pratt. Space 49.

Keuffel & Esser Company, New York, N. Y.—Surveying instruments, drawing and mathematical instruments and measuring tapes, etc. Space 48.

Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.—Automatic portable tool grinders with various attachments. Represented by Wm. L. Munk, John Wincrantz and Walter Smith. Spaces 151 and 152.

Lackawanna Steel Company, Buffalo, N. Y.—Rails, structural material, cabinets of rolled sections, illuminated views of mills, shops, mines, etc., rail joint splices, hook shoulder tie plates, rail joint plates and Lackawanna steel sheet piling. Represented by C. R. Robinson, E. Armstrong, A. P. Van Schaick, C. H. Hobbs, J. L. Hench, F. E. Abbott and A. H. Weston. Spaces 277, 278 and 279, Armory.

Lamb Railway Service Company, Cincinnati, Ohio.—Lamb weed burner, and burner for clearing frogs, switches and interlocking devices from snow and ice. Represented by W. W. Lamb and J. N. Carswell. Spaces 192 and 193.

Lehon Company, The, Chicago, Ill.—Waterproof canvas, roofing, insulating papers, sill covers, saturated burlap. Represented by Tom Lehon and D. B. Wright. Space 148.

Lidgerwood Manufacturing Company, Chicago, Ill.—Pile driving and derrick engines, hoisting machinery, rapid unloaders, incline coal hoists. Represented by Frank B. Knight, E. C. Reeder, Oscar D. Weaver and W. G. Wilmot. Space 13.

Louisiana Red Cypress Company, New Orleans, La.—Cypress trunking and capping for use in block signal systems, cross ties, car siding and roofing, cross arms, etc. Represented by C. A. Nesom and H. P. Altman. Space 251, Armory.

Lufkin Rule Company, Saginaw, Mich.—Measuring tapes and rules of every description. Represented by S. B. McGee and F. G. Brown. Space 121.

Lupton Sons Company, David, Philadelphia, Pa.—Various types of steel sash, Pond continuous sash, Pond operating devices, Lupton steel partitions, Lupton steel doors. Represented by Clarke P. Pond and R. G. Sanborn. Space 15.

M. W. Supply Company, Philadelphia, Pa.—Vaughan rail anchor. Represented by D. L. Vaughan and L. T. Burwell. Space 138.

MacRae's Blue Book Company, Chicago, Ill.—Publication. Represented by Thos. H. MacRae, Lloyd Simonson, L. R. Rollins, Albert MacRae. Space 153.

Madden Company, The, Chicago, Ill.—Three-man rail layer. Represented by P. H. Madden, F. L. Pierce and Thomas Crowley. Space 128.

Maryland Steel Company, Sparrow's Point, Md.—Pictures of various kinds, in Armory, Spaces 241, 242, 243, 254, 255 and 256, with Pennsylvania Steel Company exhibit.

C. F. Massey Company, Chicago, Ill.—Massey battery wells, chutes and boxes; portable reinforced concrete houses; concrete railway trestles and piles; culvert pipe; mile posts; pipe carrier foundations, etc. Represented by C. F. Massey, A. Christ, Jr., Chas. Gilman, D. A. Hultgren, E. M. Hatheway and H. W. Wilder. Spaces 5 and 6.

Morden Frog & Crossing Works, Chicago, Ill.—Solid and build-up manganese frogs, manganese crossing, manganese switch points, Unity, Security and G. L. M. switch stands, guard rails, guard rail clamps, compromise joints, rail braces, etc. Represented by Irving T. Hartz, Arthur C. Smith, Harry M. Macke, William J. Morden, W. Homer Hartz and B. T. Gibbs. Spaces 238, 239 and 240, Armory.

Mudge & Co., Chicago, Ill.—Motor cars for inspection and section purposes. Represented by Burton W. Mudge, Robert D. Sinclair, George W. Bender, Sherman C. Amsden, Charles E. McKee, F. S. Wilcoxen, Clive Hastings, Blake C. Howard, Royal D. Hawley, Sterling G. Turner, A. P. Grenier and Wm. H. Brinkhoff. Spaces 52, 53, 71 and 72.

National Carbon Company, Cleveland, Ohio.—Columbia track batteries, Columbia dry batteries, Columbia multiple and hot shot batteries, Columbia flashlight batteries and flashlights, Helios, storage batteries, arc light carbons, motor brushes, carbon contacts, welding carbons, carbon specialties and Patterson battery cabinets. Represented by Chas. S. Pflasterer, W. O'Connor and L. W. Fischer. Space 7.

National Concrete Machinery Company, Madison, Wis.—National concrete fence posts and machinery. Represented by Victor E. Rogers and W. L. Casady. Space 206.

National Electric Specialty Company, Toledo, Ohio.—"VAC-M" lightning arresters, signal types Nos. 1, 2, 3 and 4 for automatic block signal work and police and fire alarm telegraph; giant types for telephone and train dispatching; high tension transmission telephone lines and toll lines; telephone exchange types, both metallic circuit and grounded circuit, for ordinary subscribers' stations and local lines, and an additional new "Runt" grounded circuit telephone type. Combination lightning arrester and fuse mount, known as No. 17; "VAC-M" test sets, Handy die stock and Becker receding pipe-threader. Represented by J. T. Greene, C. F. Wall, V. A. Chapman, H. E. Gifford, Jr., H. M. Pingen and P. H. Chapman. Spaces 163 and 164.

National Indicator Company, Long Island City, N. Y.—Train indicators, station indicators, gate signs. Represented by J. Hutchinson and M. E. Penso. Space 149.

National Lock Washer Company, The, Newark, N. J.—Nut locks, shock absorbers and strain relieving devices for rail joints and other bolted construction. Represented by John B. Seymour and Alvin T. Thompson. Space 285.

National Malleable Castings Company, Cleveland, O.—Journal boxes, couplers, tie plates, rail braces, anti-rail creepers and bridge washers. Represented by C. L. Johnson, Chas. H. McCrea, J. J. Byers, T. W. Aishton, L. S. Wright, J. H. Slawson, Jas. A. Slater, J. H. Merrell and W. B. Bellman. Space 105.

National-Standard Company, Niles, Mich.—Track drills, bonding drills, drill bits, portable grinders, cattle guards, track and car jacks. Represented by W. H. Parkin, W. F. Harrah, F. A. Hastings, Eugene Cook and Walter Reynolds. Space 51.

Neely Nut & Bolt Company, Pittsburgh, Pa.—Neely spring lock, line of hot and cold punched nuts. Represented by R. A. Lackner. Space 171.

Nichols, George P., & Bro., Chicago, Ill.—Electric turntable tractor. Represented by George P. Nichols, Samuel F. Nichols, R. M. Gustonand and Henry Fries. Space 173.

Northey-Simmen Signal Company, Ltd., The, Toronto, Ontario, Canada. Simmen speed control automatic stop. Represented by P. J. Simmen and L. Ringer. Space 150.

Northwestern Motor Company, Eau Claire, Wis.—"Casey Jones" hand-car engine. Represented by K. Rosholt and R. R. Rosholt. Space 195.

Ogle Construction Company, Chicago, Ill.—Coaling stations and coal handling machinery in model and picture. Represented by R. A. Ogles, C. F. Bledsoe and M. W. Powell. Spaces 91 and 110.

Okonite Company, The, New York, N. Y.—Represented by Lewis G. Martin, J. D. Underhill, W. G. Hovey, F. J. White, W. M. Candee, J. M. Lorenz and R. H. Baker. Space 16.

Otley Paint Manufacturing Company, Chicago, Ill.—Railroad, bridge, car and iron paints, cements and graphites. Represented by Benjamin F. Otley, James J. Otley and Walter A. Otley. Space 170.

P. & M. Company, The, Chicago, Ill.—P. & M. rail anticreepers, bond wire protectors, Smith tie renewer. Represented by Philip W. Moore, Leonard W. Kent, Alvar R. Sutter, George E. Johnson, David T. Hallberg, R. Harris, John Ritchie, Royal D. Hawley, Wm. C. Lynch, Robert J.

Mercur, Wallace W. Glosser and Fred A. Preston. Spaces 123 and 124. ?

W. W. Patterson Company, Pittsburgh, Pa.—High grade, hand made tackle blocks. Represented by W. W. Patterson, Jr. Space 147.

Pennsylvania Steel Company, Philadelphia, Pa.—Anvil face frogs designs 160 and 169; solid Manard frog design 166; New Century Switch models 50A, 50B, 51A, 51B; Steelton positive switchstands, models 52A, 53A; New Era switchstand, model 49; pony main line switchstands, models 54B and 54E; main line safety switchstands, models 56B, 57B, 58B, 59B; yard stands, model 55A; Mayari heat-treated track bolts and frog bolts; Mayari heat-treated joints; Mayari pig iron; Mayari axles, crank shafts, connecting rods, shovels and iron castings; model of hook heel switch; model of split switch with facing of point lock; tests will be made on Olesen testing machine of carbon steel and Mayari; heat-treated steel joint and frog bolts. Represented by John C. Jay, Jr., Chas. S. Clark, Robert E. Belknap, H. B. Green, Neil E. Salsich, R. W. Gillespie, R. W. Read, C. Hoffman, J. F. Hennessy, J. Alfred Miller, Jr., Fred H. Ogden, H. E. Barbee, Stanley H. Smith, E. E. Goodwillie, G. S. Vickery, C. A. Alden, Wm. H. Henderson, Walter H. Allen, W. H. Philler, Geo. W. Parsons and Karl C. Banks. Spaces 241, 242, 243, 254, 255 and 256, Armory.

Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.—pictures, circulars, and literature illustrating steel structures, including elevated steel tanks, stand pipes and coaling stations. Represented by W. W. Hendrix, A. C. Pearsall, W. H. Jackson, G. A. Smith. Space 229, Armory.

Pittsburgh Steel Company, Pittsburgh, Pa.—Wire products for railroad fencing. Represented by H. C. Woodside, E. Sidney Lewis, M. E. Johnson and Geo. A. Dickson. Space 229, Armory.

Pocket List of Railroad Officials, New York, N. Y.—Pocket List of Railroad Officials. Represented by J. Alexander Brown, Chas. L. Dinsmore and Harold A. Brown. Space 26.

Positive Rail Anchor Company, Louisville, Ky.—Positive rail anchor and Betts anti-creeper tie plate. Represented by John C. Haswell, W. M. Mitchell, Jr., J. A. Shoulty and L. C. Ferguson. Space 178.

Prest-O-Lite Company, Inc., Indianapolis, Ind.—Oxy-acetylene welding and cutting outfits. Represented by W. H. Adkinson, E. J. Rork and A. L. Ward. Space 3.

Pyrene Manufacturing Company, New York, N. Y.—Pyrene fire extinguishers. Represented by J. D. Cole. Space 189.

Q. & C. Company, The, New York, N. Y.—Bonzano rail joint, Vaughan rail anchor, Q. & C. rail bender, rolled steel step joint, Q. & C. portable rail saw No. 7, Q. & C. O'Brien insulated joint, Q. & C. special guard rail clamp, Q. & C. National guard rail clamp. Represented by C. F. Quincy, F. F. Kister, T. B. Bowman, J. V. Wescott, E. M. Smith, J. A. Bodkin, A. R. Horn, H. A. Hawes, L. P. Lloyd and A. Robertson. Spaces 120 and 139.

Rail Joint Company, Tre, New York, N. Y.—Continuous Weber and Wolhaupter rail joints. Represented by L. F. Braine, Percy Holbrook, Benj. Wolhaupter, W. E. Clark. V. C. Armstrong, Fred A. Poor, H. C. Holloway, Geo. C. Isbester, Sumner Collins, E. L. Van Dressar, E. A. Condit, Jr., W. A. Chapman, J. G. Miller, R. W. Smith, W. S. Boyce, C. B. Griffin, Frank M. Hill and Chas. Jenkinson. Spaces 81 and 82.

Railroad Supply Company, Chicago, Ill.—Tie plates, derailers, highway crossing alarms, automatic flagman, electric signals and signal supplies. Represented by R. D. Hawley, P. F. Hawley, F. C. Webb, H. M. Buck, Geo. M. Kenyon, A. H. Smith, H. G. Van Nostrand, E. H. Bell, J. M. Fitzgerald, J. J. Spangler, R. S. Prentice and H. R. Knox. Spaces 85 and 104.

Railway List Company, Chicago, Ill.—Railway Engineering and Maintenance of Way and the Monthly Official Railway List. Represented by W. E. Magraw, C. S. Myers, L. F. Wilson, K. L. Van Auken, J. M. Crowe, Dalton Risley and W. R. Toppan. Space 9.

Railway Review, The, Chicago, Ill.—Railway newspapers. Represented by Willard A. Smith, Harold A. Smith, J. E. Gougeon, Charles L. Bates, W. M. Camp, A. E. Hooven and H. H. Wall. Space 64.

Ramapo Iron Works, Hillburn, N. Y.—Automatic safety switch stands, manganese reinforced switches and frogs, guard rail clamps, rolled shoulder switch slide plates, etc. Represented by J. Edgar Davidson, Wellington B. Lee, Arthur Gemunder, James B. Strong, W. C. Kidd, Geo. E. Haring, Thomas E. Akers. Spaces 280, 281 and 282, Armory.

Reading Specialties Company (owned by Reading-Bayonne Steel Castings Co.), Reading, Pa.—Step joints, guard rail clamps, rail benders, re-railers and derailers. Represented by Chas. W. Allen, J. S. Crawford, Geo. H. Sargent and Frank G. Dunbar. Space 284, Armory.

Revolute Machine Company, New York, N. Y.—Blueprinting machinery. Represented by J. V. McAdam, C. J. Everett and R. B. Snow. Spaces 273 and 274.

Richard-Wilcox Manufacturing Company, Aurora, Ill.—Railroad door hangers, parallel door hardware, underwriters' approved fire-door hardware, hangers for any door that slides. Represented by W. D. Jameson. Spaces 187 and 188.

Roberts & Schaefer Company, Chicago, Ill.—One-eighth size working model reinforced concrete counter-balanced bucket (Holmen type) locomotive coaling station, with automatic electrical equipment. Represented by Clyde P. Ross, E. E. Barrett, W. R. Ourand and James S. Shannon. Spaces 97 and 98.

William Robertson & Co., Chicago, Ill.—Robertson cinder conveyor, Robertson sand dryer, Robertson pneumatic sand hoist. Represented by William Robertson and W. S. Young. Space 283, Armory.

Sanitary Bunk Company, Indianapolis, Ind.—Sanitary steel spring bunks, etc. Represented by L. H. Mummert and O. L. Mummert. Space 191.

Scully Steel & Iron Co., Chicago, Ill.—Everlasting blowoff valve, expanders, tube cutters, hand and power tools for railroad shops, flue welder and machinery. Represented by J. W. Patterson, Geo. Mason, Jr., A. Verschuur, C. Lingenfelter and C. Mage. Space 265, Armory.

Sellers Manufacturing Company, Chicago, Ill.—Sellers anchor bottom tie plates and Sellers wrought iron angle bars. Represented by J. M. Sellers, R. A. Van Houten and G. M. Hogan. Space 246.

Signal Accessories Company, New York, N. Y.—Railway signal materials. Represented by F. C. Lavarack. Space 118.

Simmons-Boardman Publishing Company, New York, N. Y. and Chicago, Ill.—The Railway Age Gazette, Maintenance of Way Daily, The Signal Engineer and Railway Age Gazette, Mechanical Edition. Represented by Edward A. Simmons, Samuel O. Dunn, Lucius B. Sherman, Henry Lee, Roy V. Wright, John N. Reynolds, Frank S. Dinsmore, H. H. Marsh, C. R. Mills, E. T. Howson, R. E. Thayer, R. H. White, H. H. Simmons, Harold F. Lane, F. H. Thompson, Walter M. Ford, C. W. Garrison, Fred Koch, J. C. Munn and T. E. Crossman. Space 45.

Slifer, Hiram J., Chicago, Ill.—Gollos automatic train control and recording system, Cornell track spike, Wightman rail joint, crossings, frogs as manufactured by Railway's Accessories Company of Seattle, Wash. Represented by Hiram J. Slifer. Space 292, Armory.

Snow, T. W., Construction Company, Chicago, Ill.—Snow water and oil cranes, Snow bucket type coal chutes, Dupree water tank hoops and lugs, Johnson water tank lugs, Dourte valveless pump, oil engine. Represented by T. W. Snow, R. A. Blake and W. B. Lane. Space 46.

Spencer Otis Company, Chicago, Ill.—Economy steel tie plates, Kron automatic springless dial scales, Hutchins car roofs, Absolute lock nut. Represented by W. L. De Remer, Carter Blatchford, H. H. Hart, T. W. Blatchford, W. D. Thompson, David Hawsworth, L. D. Rockwell, A. J. Odegaard, Oliver Olson, John T. De Remer, W. W. Camp, A. L. Hammond, F. M. Bobo and W. W. Smith. Spaces 122, 141, 142, 143 and 144.

Standard Asphalt & Rubber Company, Chicago, Ill.—"Sarco" waterproofing, mineral rubber durable floors, insulating material, mineral rubber pipe coating and mineral rubber asphalt for various purposes, methods and applications. Represented by Chas. V. Eades, R. F. Trumbull and W. A. Hewey. Spaces 161 and 162.

Standard Underground Cable Company, Pittsburgh, Pa.—Railway signal wire of all kinds, Colonial copper clad wire, bare and insulated, light and power, telephone and telegraph cables with paper, varnished cloth and rubber insulation, lead covered and braided, Davis station terminals and Davis open air terminals with single and multiple conductor cables of all kinds. Represented by E. J. Pietzcker, R. B. Wilcox, R. C. Houck, R. E. Green and W. M. Rogers. Space 19.

Stark Rolling Mill Company, Canton, Ohio.—Toncan metal sheets and formed products, including roofing, trough, pipe car flooring and culverts. Represented by H. A. Greenberger, D. B. Coey and John Laird. Space 14.

Steel Railway Tie & Appliance Company, Denver, Colo.—Shane steel tie and safety fastener. Represented by G. H. Shane and G. F. Kiser. Space 186.

Templeton, Kenly & Co., Ltd., Chicago, Ill.—Simplex car and track jacks. Represented by Alfred E. Barron, Charles A. Crane, Jr., Eugene J. Curran, Philip G. Graf, Harry M.

Hood, J. H. Hummel, Arthur C. Lewis, Aubrey C. Mills and Walter B. Templeton. Spaces 31, 32, 33 and 34.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y.—Ferro carbon-Titanium and Titanium treated steels. Represented by H. H. Cook and A. C. Hawley. Space 294, Armory.

Track Maintainer Company, Memphis, Tenn.—Track maintainers. Represented by O. H. Courson, J. W. Dodge, Jr., and Clyde Richert. Space 227, Armory.

U. S. Wind Engine & Pump Company, Batavia, Ill.—Railway water supplies and switch stands. Represented by L. E. Wolcott and C. E. Ward. Spaces 111 and 112.

Union Draft Gear Company, Chicago, Ill.—Cardwell friction draft gear, Cardwell rocker side bearing. Represented by L. T. Canfield, J. E. Tarelton, H. B. Barnard, C. J. Gorman, W. G. Krauser and J. W. Hathaway. Space 109.

Union Switch & Signal Company, Pittsburgh, Pa.—Mechanical, electro-mechanical, electric and electro-pneumatic interlockings, automatic block signals (A. C. and D. C.), Keystone insulated joints and other signal accessories. Represented by S. G. Johnson, G. A. Blackmore, J. S. Hobson, W. H. Cadwallader, L. F. Howard, J. P. Coleman, J. G. Schreuder, H. W. Griffin, H. A. Wallace, T. H. Patenall, J. W. White, J. J. Cozzens, Aaron Dean, W. W. Talbert, M. D. Hanlon, F. B. Corey, H. McCready, A. C. Livermore, W. P. Neubert, V. K. Spicer, J. F. Hays, W. H. Arkenburgh, C. O. Harrington. Spaces 60, 61, 62, 41, 42 and 43.

Universal Metallic Tie Company, Salt Lake City, Utah.—Metal cross-ties. Represented by B. S. Rupp, T. E. Hall, A. M. Smith and William McDaniels. Space 203.

Verona Tool Works, Pittsburgh, Pa.—Track tools, track jacks, gauges, levels and nut locks. Represented by H. S. Paul, W. H. Remmel, Henry Fischer, E. Woodings, Rex S. Gay, James C. Barr and Howard C. Mull. Space 129.

West Coast Lumber Manufacturing Association, Tacoma, Wash.—Factory timbers, bridge stringers, car material, dimension clears, tank stock, hemlock, crating stock, timber section 40 in. by 40 in. fourteen years in service on dredge. Represented by E. R. Hutchins, R. G. Hutchins, T. E. Hutchins and C. B. Hutchins. Spaces 290 and 291, Armory.

Western Electric Company, Chicago, Ill.—W. E. telephone train dispatching equipment, Habirshaw signal wires, W. E. Sturtevant vacuum cleaners for cars, W. E. signal bells, W. E. pole line construction specialties. Represented by F. A. Ketcham, G. H. Porter, J. A. Kick, E. W. Hamlin and L. A. Muttart. Space 50.

Whall, C. H., & Company, Boston, Mass.—"Whall's special railroad fibre" railroad signal fusees. Represented by F. R. Whall. Space 127.

William Wharton, Jr., & Co., Inc., Philadelphia, Pa.—Manganese steel frogs, switches, switch stands, guard rail clamps, plans of important layouts. Represented by Victor Angerer, Geo. R. Lyman, R. C. McCloy, H. F. McDermott, J. S. Morrison and W. L. Wright. Spaces 247, 248, 249 and 250, Armory.

Winans Improved Patent Rail Joint Company, Portland, Ore. Space 172.

Winslow, Horace L., Company, Chicago, Ill.—Feed water heaters, washout systems and sand dryers. Represented by H. L. Winslow, W. J. Frein, F. E. Grenley and G. A. Adkins. Space 156.

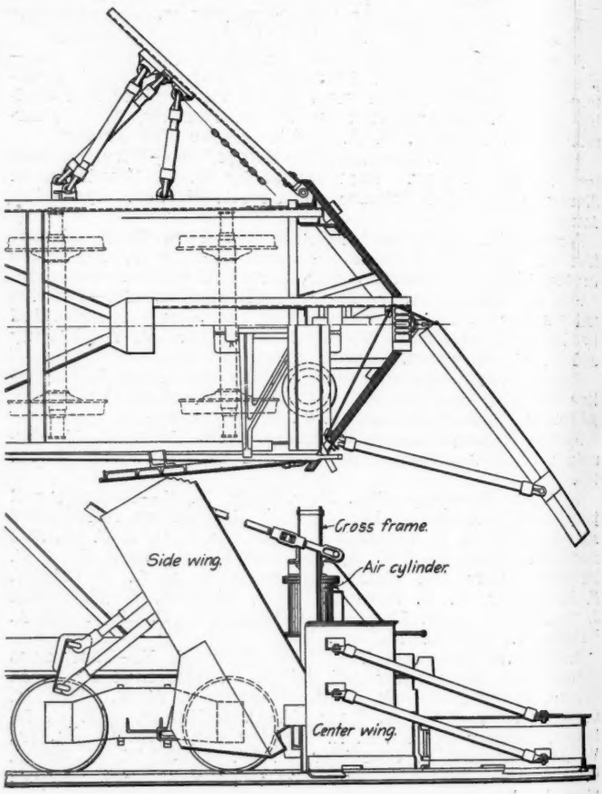
The Wyoming Shovel Works, Wyoming, Pa.—Track shovels and locomotive scoops. Represented by G. E. Geer. Space 286, Armory.

Yale & Towne Manufacturing Company, New York, N. Y.—Railroad locks and hardware and safety coach door controllers. Represented by W. C. Bigelow, Manager Specialties Department, and W. R. Pflasterer. Space 8.

IMPROVED MANN-McCANN SPREADER

A number of spreaders placed in service last summer by the Mann-McCann Co., Chicago, were designed to facilitate the addition of a large center spreader and flanger which was being developed. The design of this center wing which will effect an important improvement over the method of center spreading used on the former machine has now been completed and patent applied for. The new spreader is pointed and extends up above the car floor, the sills being framed to give the front end of the car the proper shape to fit closely inside the wing. For ordinary spreading the height of the wing is 5 ft. 3 in., but if desired it can be made higher to handle snow. The wing has a vertical movement of one foot, the lower edge being 8 in. above the top of rail when in the raised position. For spreading it can be set at any height down to its limit of 4 in. below the rail top. This wing is operated by two 16-in. air cylinders mounted on the car floor and pushing up against a trussed beam spanning the width of the car and attached by rigid framing to the wing plate. The main side wings and the new center wing are operated by the same air cock from the operator's platform in the center of the car. The center spreader can be operated alone or with either one or both of the side wings, allowing the operator to immediately adjust the spreading wings to the working conditions.

Another improvement which will be generally used with this type of spreader in the future is the ditching plate which can be attached to the bottom of the main



Mann-McCann Spreader with New Center Wing.

wing. By swinging that wing out a ditch can be made at any distance from the tracks within the length of the wing. The shape of this plate can be designed to give any desired cross section of ditch. The principal use of this ditching plate is to open up drains temporarily in the wet season to let surface water escape and avoid the forming of soft spots in the track. A similar plate has been used for ditching on one of the Santa Fe spreaders with good results. Ditching can be finished in this way at the rate of five miles per hour. The plows which are furnished with these spreaders for breaking up ground under the wings have been provided with a chain which automatically pulls the plow into shape for work when the wing is dropped into place. This plow cuts a maximum of 6 ft. below the top of rail at a distance not exceeding 20 ft. from the track center and 8 ft. above the rail at a distance of 10 ft., as in the case of plowing down banks.